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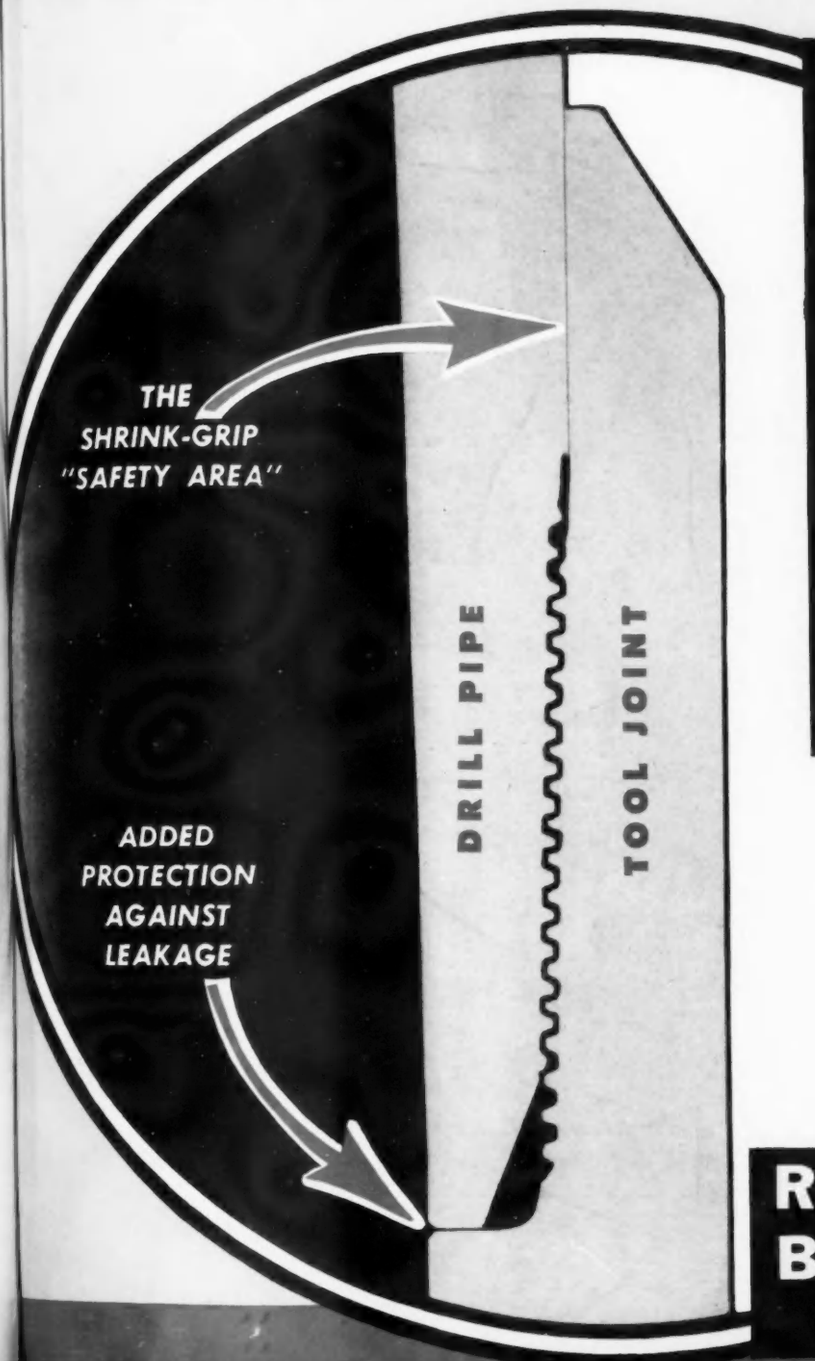

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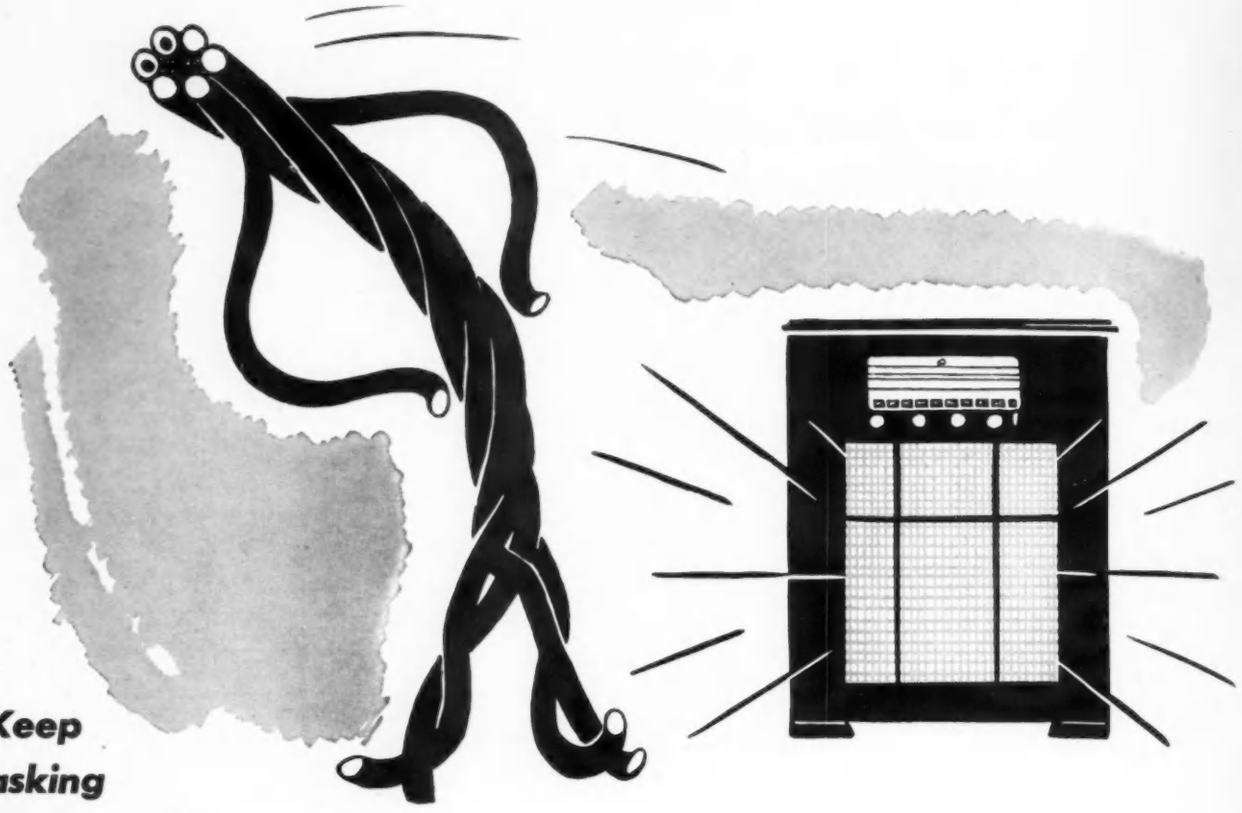

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The OIL WEEKLY and The COMPOSITE CATALOG for the drilling-producing-pipeline industry

PETROLEUM REFINER and The REFINERY CATALOG for the refining-natural gasoline industry

LOOKING AHEAD
. . . with the Editor

PERSONNEL changes in the drilling, producing and pipe-line branches of the oil industry have been so great since Pearl Harbor that many newcomers have had little chance to do more than master the basic principles of their job, in the haste to provide organization to permit continuation of the oil flow to the nation and the war agencies.

To bring to these men, and also to review for those men long in operational production supervision, the best of the *operating* hints which have appeared in THE OIL WEEKLY in the specialized departments set apart for this service, it is planned during February to carry four pages of such hints instead of two for the branch of industry being covered.

Thus, beginning February 7, there will be four or more pages of Operating Hints, selected from the best which have been presented through these columns.

THE OIL MAN'S CALENDAR

FEB. 20–24	American Institute of Mining and Metallurgical Engineers, Waldorf-Astoria, New York.
MAR. 21–23	American Association of Petroleum Geologists, Society of Exploration Geophysicists and Society of Economic Paleontologists and Mineralogists, Baker Hotel, Dallas.
APRIL 10–12	National Association of Corrosion Engineers, Annual Meeting, Rice Hotel, Houston.
24–25	National Oil Scouts and Landmen's Association, Dallas.
NOV. 13–16	American Petroleum Institute, Stevens Hotel, Chicago.

THE OIL WEEKLY

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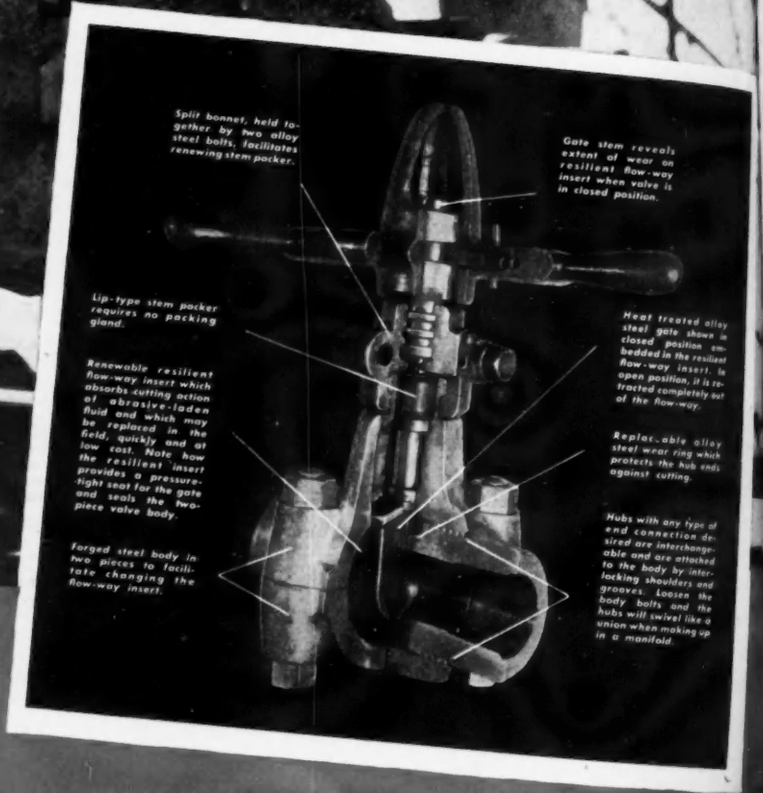
Thus, the first and only mud line valve . . . the Cameron "Flex-Seal" . . . solved the rig owner's mud line valve problem whose cost records reveal that they are saving up to 98% maintenance over conventional valves and stop cocks.


Split bonnet, held together by two alloy steel bolts, facilitates renewing stem packer.
Gate stem reveals extent of wear on resilient flow-way insert when valve is in closed position.
Lip-type stem packer requires no packing gland.
Heat treated alloy steel gate shown in closed position embedded in the resilient flow-way insert. In open position, it is retracted completely out of the flow-way.
Renewable resilient flow-way insert which absorbs cutting action of abrasive-laden fluid and which may be replaced in the field, quickly and at low cost. Note how the resilient insert provides a pressure-tight seat for the gate and seals the two-piece valve body.
Replaceable alloy steel wear ring which protects the hub ends against cutting.
Hubs with any type of end connection desired are interchangeable and are attached to the body by interlocking shoulders and grooves. Loosen the body bolts and the hubs will swivel like a union when making up in a manifold.
Forged steel body in two pieces to facilitate changing the flow-way insert.

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The Changing Panorama

1943-1944

THE petroleum industry almost certainly will experience further rises in production, refining and consumption rates this year, after having recorded exceptionally sharp gains that sent these operations soaring to substantially higher all-time peaks last year.

With larger numbers of planes, ships and tanks due to come off assembly lines, and with more intensive fighting anticipated in both the European and Pacific theatres of war, all signs indicate that wartime use of petroleum, although already at record volumes, has not yet reached its maximum level. Therefore, a greater demand for oil than ever required before, and considerably above current peak rates, must be satisfied during 1944. Rising consumption will necessitate greater production and refinery operations, if progress of the war is not to be impaired.

New Problems Ahead . . .

In attempting to produce and refine the record volumes that will be required in 1944, the industry will be confronted with new problems, as well as a continuation of previous ones.

During the first two years of war, oil has been confronted with the problems of transportation, manufacture of aviation gasoline, manufacture of synthetic rubber, lack of manpower, and a shortage of equipment materials. These same problems will continue to exist during the third year of war, some to a lesser degree and others more critical than in the past. In addition, the year likely will witness new problems consisting of shortages in producing and refining capacities.

The newest prospective problem, and one that promises to become the industry's most acute, is the question whether sufficient crude oil can be produced to meet requirements.

Production Shortage . . .

In view of the poor discovery trend that has existed in recent years, skyrocketing production of crude oil in the United States, as it attempted to keep pace with climbing demand, has wiped out almost all surpluses of oil in this country. By early spring, when new pipe line outlets from West Texas will be finished, this nation shall be utilizing every barrel of crude oil it can produce efficiently.

Consequently, there is growing doubt that the United States can produce any such quantity as appears will be needed. The United States may be short of oil itself before the end of this year.

Any deficiency between estimated requirements of the United States and actual producing ability, of necessity, must be made up through enlarged production in other countries. However, the supply situation of the world, like that of the United States, has become urgent and pressing. Production of most foreign countries was boosted to or near all-time peaks during the latter part of 1943, after a very slow start, which creates doubt as to how much more they can produce and deliver without drilling of additional wells and building of new pipe line and terminal systems.

The question of an adequate supply of crude oil likely will overshadow all other problems before the close of the current year.

Record U. S. Output . . .

An outstanding development of the year 1943 was the unusually sharp rise in production levels of the United States. Throughout the year, except in June and December, crude production climbed swiftly upward. At the end of the year, the nation was producing 500,000 more barrels per day than a year ago.

In view of this trend, crude output of the nation reached a mark of approximately 1½ billion barrels, an increase of 8.3 percent above 1942 figures and 7.1 percent higher than the prewar peak attained in 1941. Continuation of the current daily rate during 1944 would result in the United States producing 7 percent more than it produced last year, and actually, output may increase 10 percent or more.

Rise in World Output . . .

Primarily reflecting the sharp stepping up of United States production, all previous world producing records were broken during 1943. In view of anticipated further gain in the United States, plus indicated important increases outside this country, the world is almost certain to reach another new all-time high during 1944.

In producing the unprecedented output of about 2,271,818,000 barrels during 1943, the world produced 10.8 percent more oil than in the preceding year, but production during 1944 apparently will be at least 10 percent greater than this record.

Enlarged production from Caribbean and Near East nations loom impressively in prospects for higher world production in 1944.

Stocks Are Down . . .

In meeting unprecedented demand, the industry must depend almost wholly on current production, for there is very little crude oil in excess of necessary working stocks in storage, and refined product stocks are materially lower than in preceding years. Consequently, the industry must produce and refine during 1944 all the oil and products needed on a daily scale equivalent to requirements.

Fewer New Wells . . .

Although the industry is being called upon to produce a record quantity of a most vital war material, wartime restrictions have curtailed its development operations far below normal levels. During 1943 only 19,912 wells were completed, a decline of 10.5 percent from the reduced 1942 figure and the least number for any year since the depression. Manpower and material shortages, together with below-parity price for crude oil, are the factors that have brought about this very undesirable situation.

To Drill More Wells . . .

The need for more oil to win the war, makes it imperative that the industry be permitted to return to a more normal drilling scale. However, war limitations apparently will allow only a partial recovery during 1944.

Indications are that something like 24,000 wells will be drilled in the United States during 1944. Currently, this figure is the goal set by PAW. THE OIL WEEKLY's annual forecast of drilling sets

the probable number of completions at 23,535 wells on one basis, and at 25,476 wells on a slightly different basis. These figures are for new wells seeking oil and gas, being exclusive of input wells and other similar operations.

While this gain of approximately 25 percent is a trend in the right direction, drilling operations still will not be in line with the pace of producing oil. The United States is expected to produce at least 15 percent more oil in 1944 than its prewar record year of 1941, while its drilling operations are curtailed about 25 percent. Truly a great responsibility has been placed upon the industry, and the outlook is such as to constitute a definite warning that it may be impossible to produce enough oil to meet wartime consumption, especially if military usage continues to expand at anticipated rates.

Wildcat Drilling Up . . .

Despite completion of fewer wells, a record number of wildcat tests were completed during 1943 as the industry attempted valiantly to find new petroleum reserves that might provide producing capacity adequate to satisfy future consumptive requirements.

The peak was the result of an exceptionally sharp increase during the latter part of the year, which indicates exploratory drilling in 1944 likely will exceed the high level attained last year. This conclusion also is borne out by a survey of drilling prospects, which shows that nearly 4700 wildcats may be completed during the current year.

There were a total of 3599 wildcats completed in 1943, in contrast with 3219 during 1942, a most unusual achievement in view of the reduced rate of drilling.

Less New Sources Found . . .

Completion of a record number of wildcats, however, failed to provide as many new sources of supply as in the preceding two years, marking 1943 as another disappointing exploratory period. A total of 500 new sources were found, consisting of 348 new fields and 152 new producing horizons in known pools. These figures compare with 523 new sources of supply discovered in 1942, of which 348 were new fields and 175 were new producing zones. The decline, unfortunately, was most severe in oil fields and oil pay horizons, there being 13 less new oil fields and 34 fewer oil producing pays discovered.

Not Enough Oil Found . . .

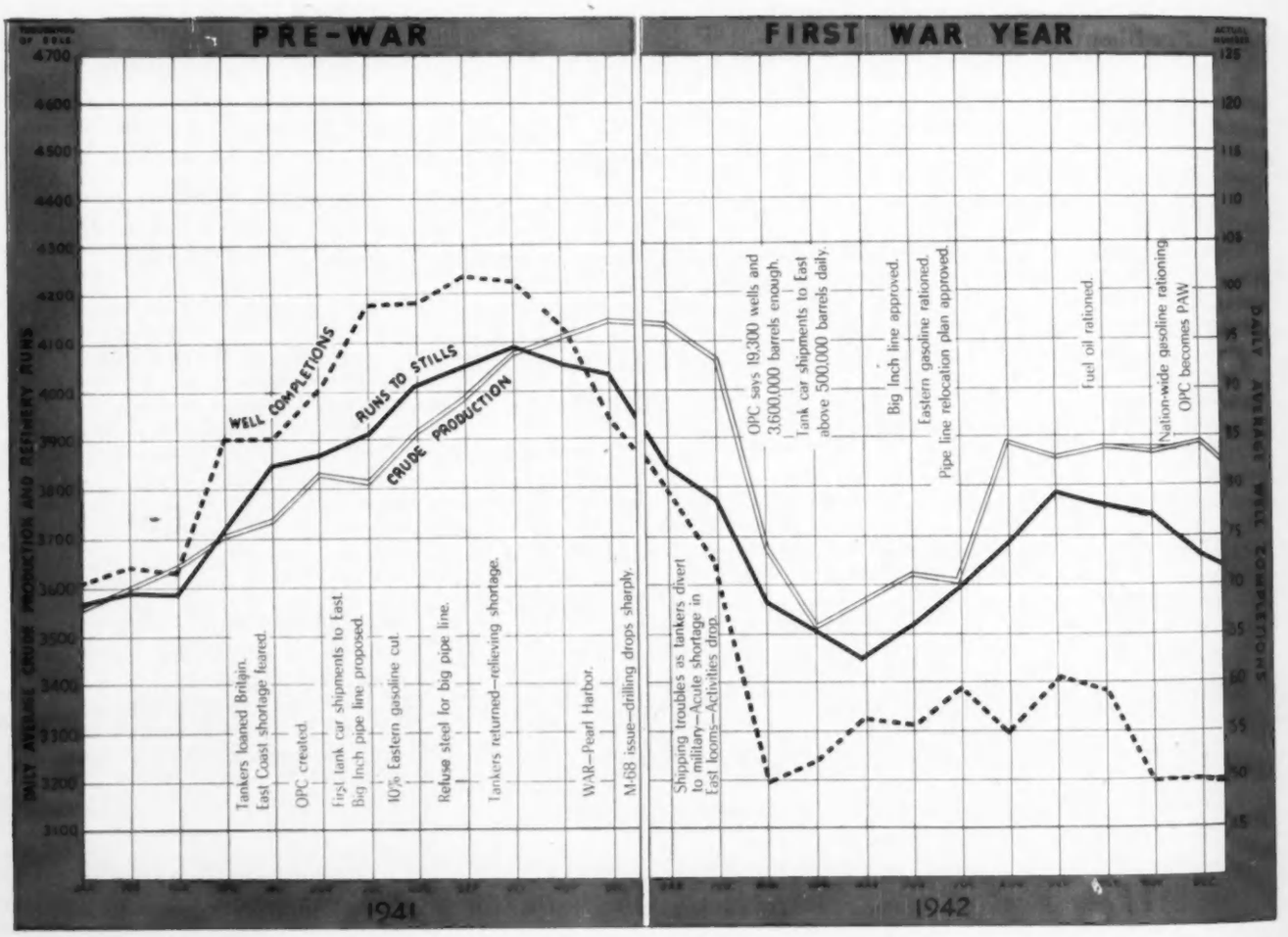
Further anxiety over the ability of the nation to produce materially larger quantities is created by estimates which indicate that the total volume of new oil found and proved during the year lacked a third of a million barrels of equaling record production.

In comparison with its production of 1½ billion barrels, the nation found and proved the existence of only an estimated 1,174,363,000 barrels, the lowest volume discovered in many years. This loss reduced net known underground reserves of petroleum at the end of 1943 to 19,755,253,000 barrels, in contrast with the American Petroleum Institute's estimate of 20,082,792,000 barrels a year ago.

Output Per Well Up . . .

Experiencing a subnormal gain in growth of producing oil wells, due to reduced drilling operations, it was neces-

Wartime Changes in Principal Oil



sary for existing wells of the United States to be called upon to produce more crude oil in 1943, and a further increase is indicated for 1944.

As against a gain of 7856 producing oil wells annually during the preceding 12 years, a net growth of only 2868 wells was recorded in 1943. While this increase boosted total producing wells to an all-time high of 410,125 at the end of the year, the growth was not in line with the sharp stepping up of production, and the average daily production per well jumped to a record high of 10.1 barrels daily from only 9.3 barrels per well per day during 1942.

More Wells Pumping . . .

The necessity of increasing output per well to meet requirements, naturally, has resulted in forcing a greater number of the nation's producing wells to depend upon artificial lift to obtain their oil. At the end of 1943 there were almost 4000 more wells producing by artificial lift than 12 months previous, while the number of flowing wells had declined nearly 1000.

Indications are that the rate of wells going on artificial lift will be accelerated during 1944, when it is estimated that 13,058 wells will cease flowing, as compared with 10,161 such wells in 1943.

Peak Refining Indicated . . .

In endeavoring to produce enough petroleum products to satisfy essential requirements, refining plants of the United States must operate at practically full capacity during 1944. The outlook is for materially higher runs to stills than the all-time peak of 1,427,142,000 barrels of 1943, which was 93 million barrels greater than the 1942 total.

Only the most skillful adjustment of refining yields, plus the charging of large quantities to stills, will permit the gearing of product output to the high level and variety of consumptive demand. The problem of adjusting yields is likely to be more acute than heretofore, for now motor fuel needs, in contrast with preceding wartime trends, are increasing along with that for fuel oils, aviation gasoline and other products. Despite great gain in aviation fuel facilities, a worry of much importance will be that of manufacturing enough 100-octane gasoline for the hordes of planes that will be in operation. Construction of new plants has not yet solved this important problem.

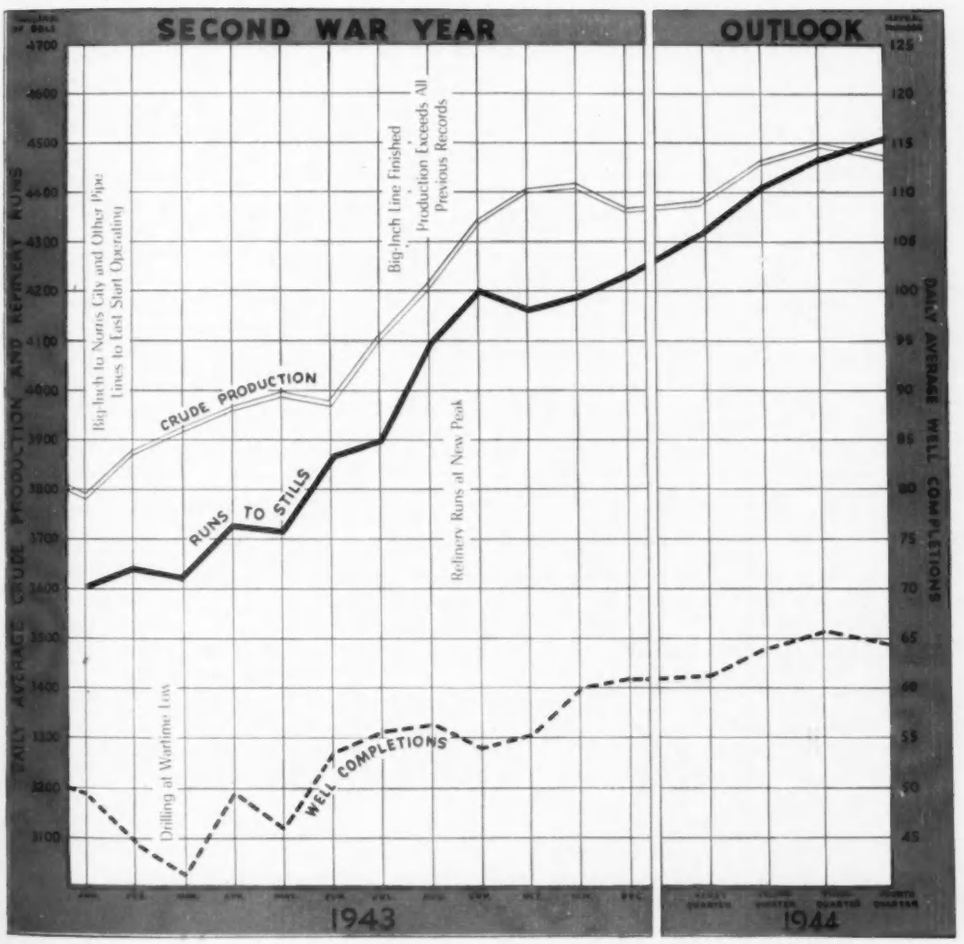
Transportation Improved . . .

With the enormous government-industry war emergency pipe line program pushed forward to such an extent that it was largely completed during 1943, the oil transportation situation of the United States showed vast improvement, and will be less acute than in the past two years. It will soon be possible to deliver 700,000 barrels of crude oil and products into the Eastern area daily through pipe lines, which, with railroad, barge and tanker movements, will give the region a supply of 1,625,000 barrels per day, or as much as was delivered before the war.

The world petroleum transportation picture also registered significant improvement during 1943, due to construction of a record number of tankers. In the United States, 252 ocean-going carriers were added to the nation's oil fleet, as against only 62 vessels in 1942.

However, the demand for oil continues rising at such rapid pace, that the industry will operate on the closest of transportation margins for months to come. Whereas the primary problem within the United States in the past has been that of getting oil to the East Coast, the necessity of providing means of moving larger quantities to the West Coast may become critical before the end of 1944.

Industry Operations



Gas Output Up . . .

Like its sister industry, natural gas is being called upon to produce record quantities. Total production reached 3¼ trillion cubic feet during 1943, the highest output yet recorded, and a gain over 1942 of about a quarter trillion feet. The industry was serving 2.8 percent more customers and sold 12.2 percent more gas than in 1942.

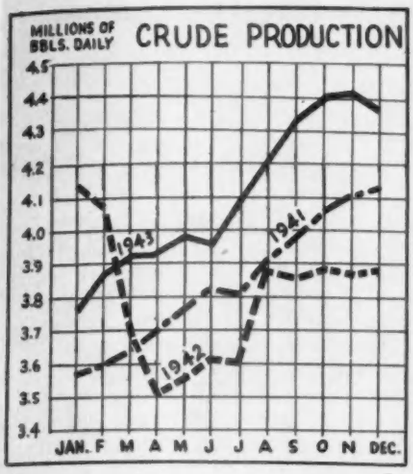
Salient Annual Statistics

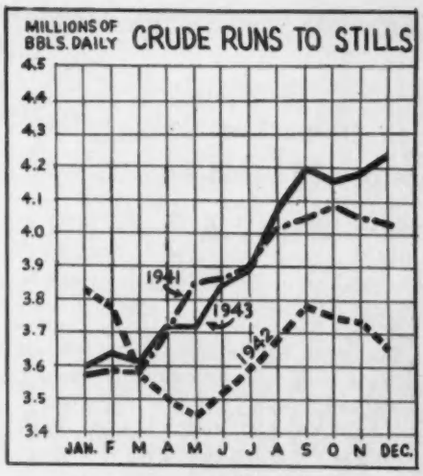
	1943	1942	1941	Percent Change of 1943 From 1942	Percent Change of 1943 From 1941
Total Demand (All Oils)	*1,657,200,000	1,548,800,000	1,578,300,000	+ 7.0	+ 5.0
Crude Oil (Domestic)	*1,496,000,000	1,396,184,000	1,420,517,000	+ 7.1	+ 5.3
Motor Fuel	623,000,000	624,200,000	*694,600,000	— 0.2	— 10.3
Residual Fuel	(?)475,000,000*	416,000,000	395,462,000	+ 14.2	+ 20.1
Distillate Fuel	(?)220,000,000*	208,000,000	192,600,000	+ 5.8	+ 14.2
Crude Production	*1,501,903,000	1,386,645,000	1,402,228,000	+ 8.3	+ 7.1
Crude Runs to Stills (Total)	*1,427,142,000	1,334,103,000	1,409,192,000	+ 6.9	+ 1.3
Domestic Crude Runs	*1,416,000,000	1,319,500,000	1,358,300,000	+ 7.3	+ 4.2
Major Product Production:					
Motor Fuel	617,000,000	608,900,000	*701,294,000	+ 1.3	— 12.0
Refinery Gasoline	530,000,000	530,376,000	*623,285,000	+ 0.1	— 15.0
Natural Gasoline, etc.	*95,000,000	85,719,000	84,290,000	+ 10.8	+ 12.7
Less L.P.G. Sales, etc.	8,000,000	7,195,000	6,281,000	+ 11.2	+ 27.4
Residual Fuel	*416,500,000	358,901,000	342,367,000	+ 16.0	+ 21.7
Distillate Fuel	*211,600,000	196,714,000	189,177,000	+ 7.5	+ 11.8
Stocks End of Year (All Oils)	489,776,000	497,940,000	556,425,000	— 1.6	— 12.0
Refinable Crude Oil	240,992,000	234,889,000	246,884,000	+ 2.6	— 2.4
Heavy California Crude	8,234,000	10,865,000	10,179,000	— 2.4	— 1.9
Natural Gasoline	4,350,000	4,632,000	4,437,000	— 6.1	— 2.0
Refined Product Stocks	236,200,000	247,554,000	294,310,000	— 4.6	— 19.7
Motor Fuel (Including Unfinished)	76,302,000	80,116,000	94,098,000	— 4.7	— 18.8
Residual Fuel	49,096,000	61,783,000	82,959,000	— 20.5	— 40.8
Distillate Fuel	42,431,000	44,940,000	49,330,000	— 5.5	— 13.9
Crude Reserves End of Year	19,745,253,000	*20,082,793,000	19,589,296,000	— 1.7	+ 0.8
New Oil Proved to Exist	1,164,363,000	1,878,976,000	1,968,963,000	— 38.0	— 40.9
Through New Pools Discovered	558,138,000	260,051,000	429,974,000	+114.6	+ 29.8
Through Pool Extension-Development	606,225,000	1,618,925,000	1,538,989,000	— 62.5	— 60.6
New Fields Discovered	*348	*348	341	0.0	+ 2.1
New Oil Fields Found	275	*288	283	— 4.5	+ 2.8
New Gas Fields Found	55	47	52	+ 17.0	+ 5.8
New Distillate Fields Found	18	13	11	+ 38.5	+ 63.6
New Pay Horizons Discovered	152	175	*267	— 13.1	— 43.1
New Oil Pays Found	129	163	*242	— 20.9	— 46.7
New Gas Pays Found	13	10	13	+ 30.0	.....
New Distillate Pays Found	10	2	2	+400.0	+400.0
Total New Fields and Pays Found	500	523	*608	— 4.4	— 17.8
Wildcats Drilled (Including Outposts)	*3,599	†3,219	†3,264	+ 11.8	+ 10.3
Productive	643	493	503	+ 30.4	+ 27.8
Non-Productive	2,956	2,726	2,761	+ 8.4	+ 7.1
Completions	19,212	21,454	32,210	— 10.4	— 40.3
Oil Wells	9,812	11,298	20,067	— 13.1	— 51.0
Gas Wells	1,594	1,973	2,653	— 19.2	— 39.9
Distillate Wells	76	105	‡	— 27.6	‡
Dry Holes	6,022	5,818	7,141	+ 3.5	— 15.7
Gas Input Wells	91	72	117	+ 26.4	— 22.2
Water Input Wells	1,576	2,141	2,185	— 26.4	— 27.9
Water Disposal Wells	41	47	47	— 12.8	— 12.8
Drilling Footage During Year	58,664,779	65,179,338	95,452,523	— 10.0	— 38.5
Producing Oil Wells End of Year	*410,125	407,257	403,582	+ 0.7	+ 1.6
Flowing Wells	46,350	47,270	47,749	— 1.9	— 2.9
Pumping Wells	*363,775	359,987	355,833	+ 1.1	+ 2.3
Pipe Line Construction (Miles)	7,671	7,550	7,300	+ 1.6	+ 5.1
Oil Lines Completed	3,795	4,200	2,900	— 9.6	+ 30.8
Gas Lines Completed	262	1,250	1,700	— 79.0	— 84.6
Product Lines Completed	3,614	2,100	2,700	+ 72.1	+ 33.8
Natural Gas Sales (MCF)	*1,983,487,000	1,767,814,000	1,605,973,000	+ 12.2	+ 23.5

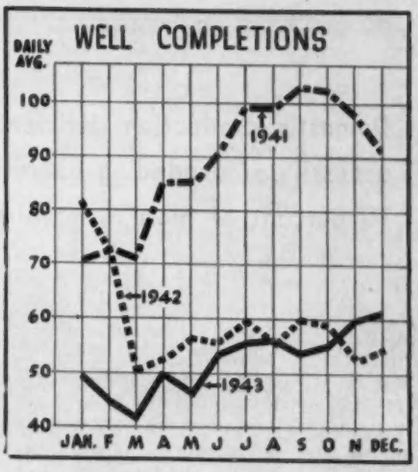
* All-time record. † Wildcat data for 1942 and 1941 from Dr. Frederic Lahee's reports.

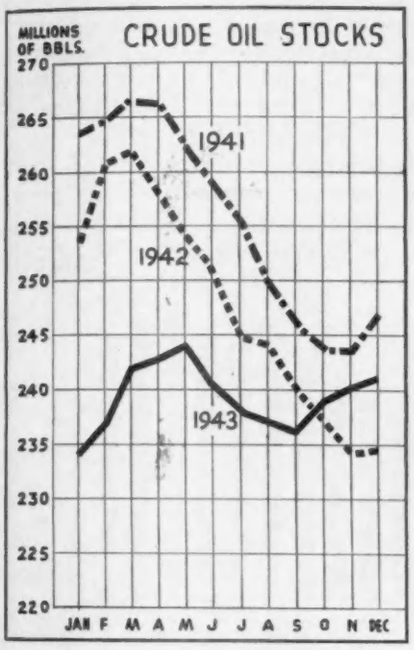
‡ Distillate wells included with oil wells in 1941.

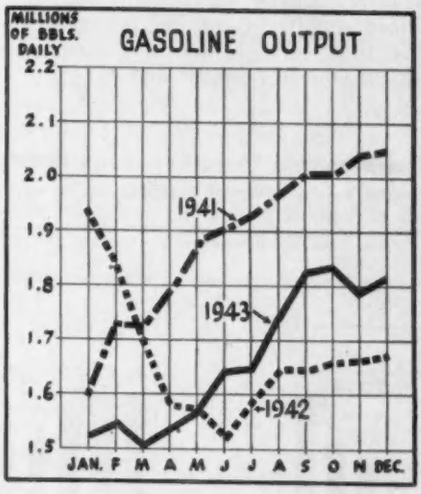
Monthly Activity Trends

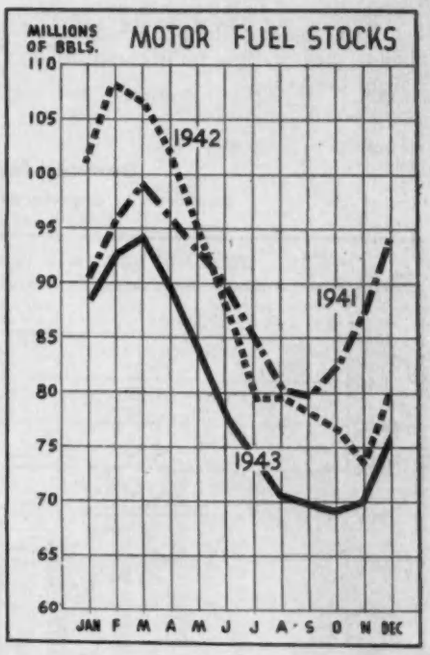


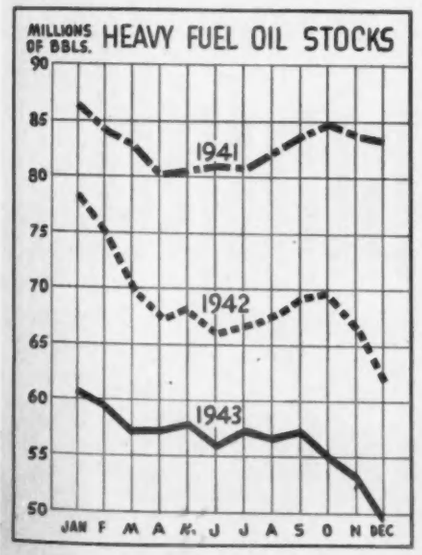


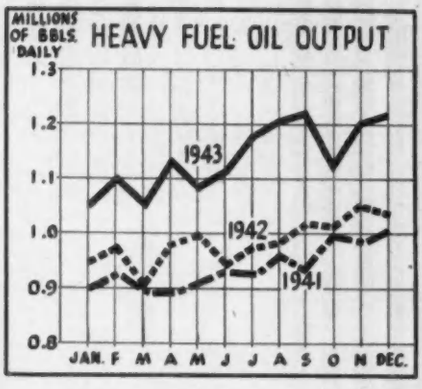


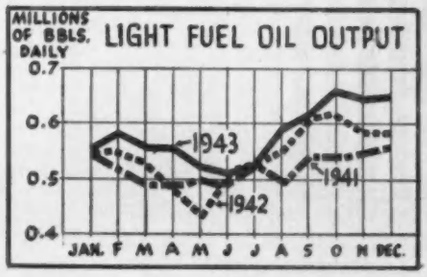


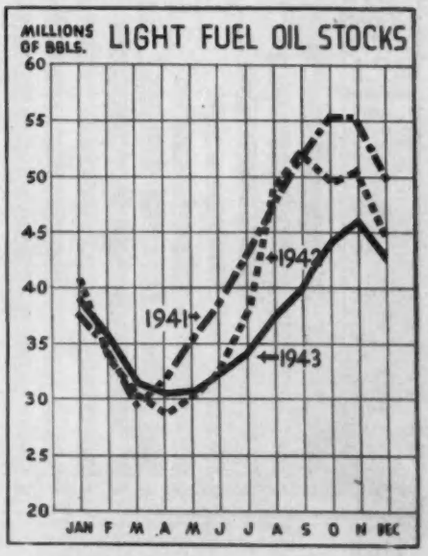












Use of Oil Expected to Exceed

Domestic production deficiency in prospect in view of the necessity of expanding operations beyond peaks of 1943 by 10 percent or more if requirements for oil are to be met

FOLLOWING the temporary setback in 1942, when transportation was disrupted by the submarine attacks on American tankers, a sharp recovery in the use and production of oils by the United States occurred in 1943, and several new all-time records were established in the industry's operations, although they are due to be surpassed by figures for 1944.

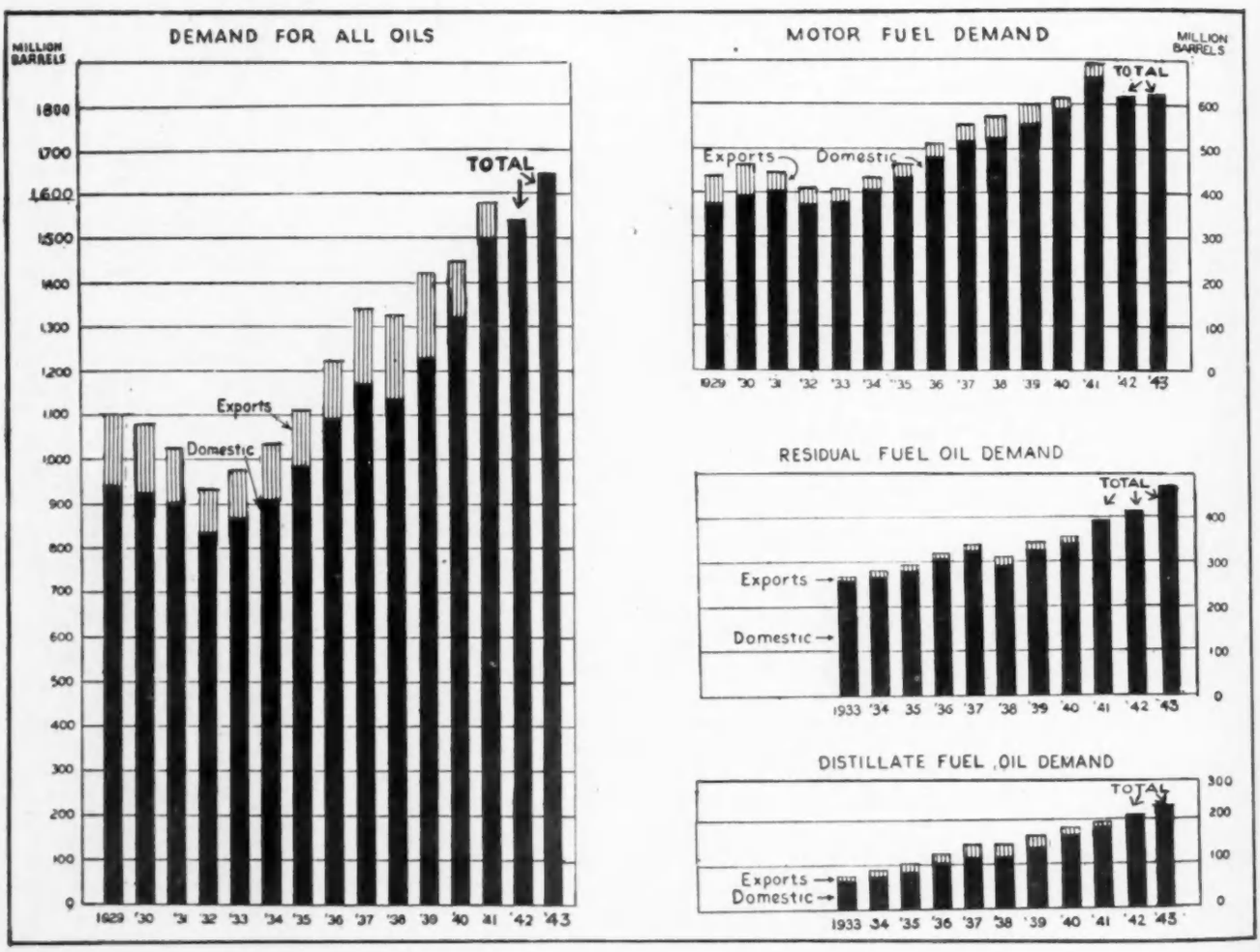
This year will bring a further sharp increase in the demand for petroleum, it is indicated, and operations in general will have to be expanded beyond those of 1943 in the order of 10 percent or more if requirements are to be met.

Total demand for all oils had declined slightly in 1942, in reflection of the transportation difficulties, but in 1943 it jumped 7 percent and was 5 percent greater than in 1941, last prewar year for the United States, and former all-time peak year in petroleum demand. The new record demand for all oils in 1943 in the amount of 1,657,200,000 barrels represented an average of 4,540,000 barrels per day. These figures included natural gasoline and benzol, as well as petroleum, and the requirements of each of those items showed increases for the year. In 1944, the total demand for all oils apparently will further increase around 10 percent or more, although there may be difficulty in fully meeting the requirements.

In any case, it will be necessary, apparently, to import comparatively large quantities of crude and heavy fuel oils—as much as, or more than, before Pearl

Demand for Petroleum in 1943 Exceeded Previous Records

Breakdown by domestic and export use for 1942 not available due to wartime censorship on statistics



Current Unprecedented Levels

Harbor, to supplement prospective or hoped-for domestic production. Almost certainly, there will be urgent demand for all the domestic production that can be efficiently turned out, even if the industry widely expands secondary-recovery operations, carries out large-scale rehabilitation of producing properties, and effectively bolsters producing ability through discovery of new fields in a greatly intensified wildcatting program. All these stimulants to domestic production will be necessary, it should be stressed, even under the assumption of the sharply increased imports. The unprecedented demand is definitely in prospect, and it can be fulfilled only through increases in imports and domestic production. The only other solution would be further restriction and handicapping of civilian pursuits, at the expense of maximum afficiency in providing services and in producing and handling materials and supplies necessary for winning the war.

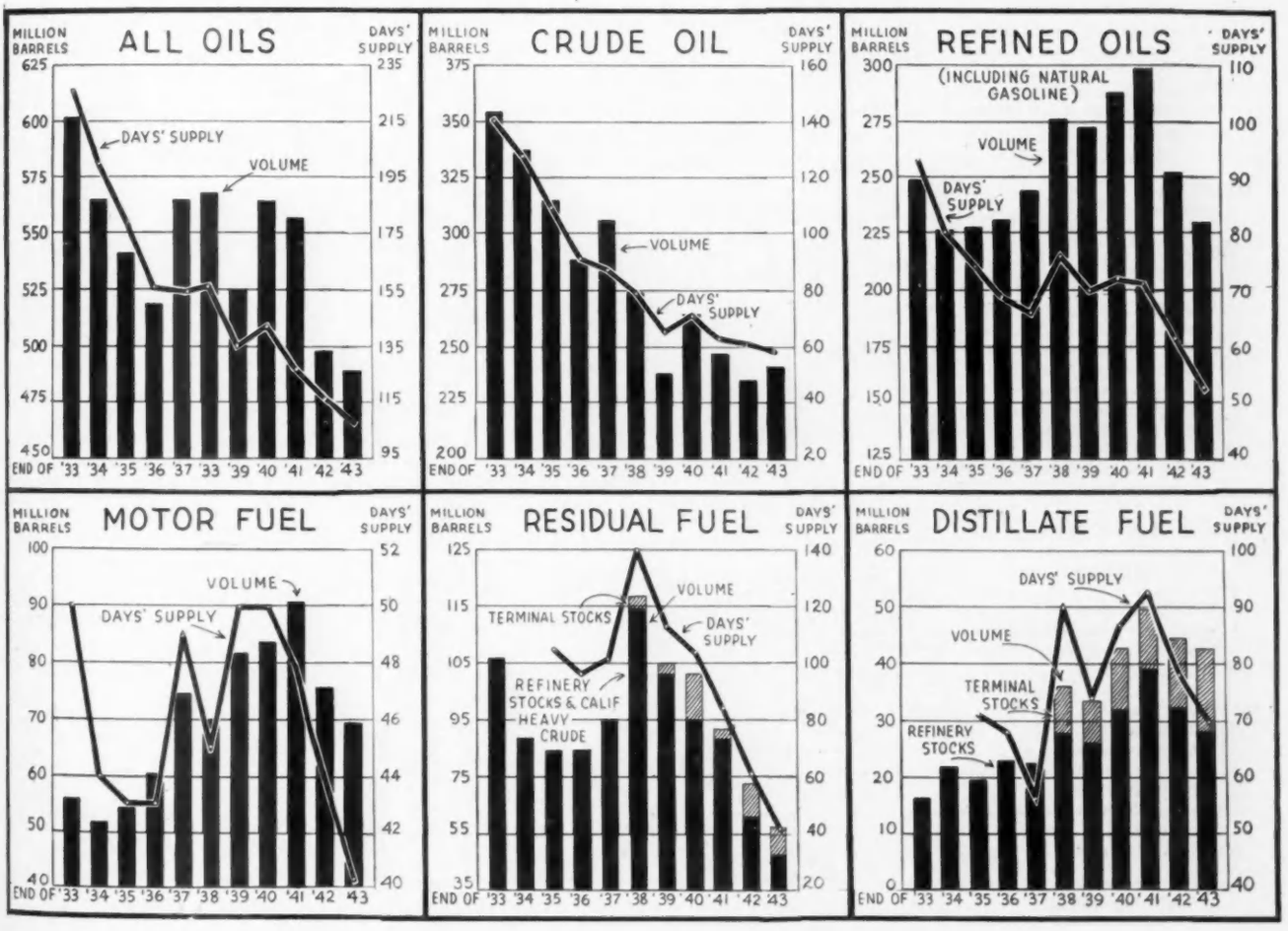
Even in the latter part of 1943, United States crude-oil production was crowding the limits of efficient producing ability of the nation. For the output of the wells was increased sharply as the year advanced, while total efficient producing ability of all wells declined, under the stepped-up takings from wells and the sub-normal build-up in number of producing wells, due to restricted drilling and premature abandonments. In 1944, therefore, for the first time since the First World War period, there is in prospect a deficiency of domestic production.

United States production in 1943 totaled 1,501,903,000 barrels, having averaged 4,115,000 barrels daily during the year. That was 8.3 percent more than production in 1942 and 7.1 percent more than the previous record output of 1,402,228,000 barrels in 1941. If the industry is permitted access to sufficient materials and manpower to carry out the intensified wildcatting and proven-field development that it considers essential, it may be able to produce in 1944 around 10 percent more domestic crude than it did in 1943. Such an increase would place production for the year at 1,600,000,000 barrels, an average of 4,525,000 barrels daily, compared with current production of 4,365,000 barrels a day.

In meeting the unprecedented demand for petroleum this year, the industry will have to depend almost wholly on the new supply in the form of domestic production and imports, as there is in storage very little crude oil in excess of

United States Had Less Oils in Storage at End of 1943

Days' supply obtained by dividing stocks end of year by daily average total demand (domestic and export) of same year



necessary working stocks. It was necessary to take 12,000,000 barrels of crude from storage in 1942 in meeting the transportation emergency of that year, and during 1943 there was a replacement of only 6,000,000 barrels of refinable crude to United States stocks, while stocks of heavy crude oil in California were further reduced to the extent of 4,500,000 barrels. At the end of 1943 all stocks of crude totaled 249,226,000 barrels, including 240,992,000 barrels of refinable and 8,234,000 of heavy in California. Although the stocks of refinable crude were 6,000,000 barrels larger at the end of 1943 than at the end of 1942, demand meanwhile had increased, too, with the result that stocks as of December 31, 1943, represented only 58.8 days' supply, at the daily average rate of demand during the year, whereas the stocks of December 31, 1942, represented 61.4 days' supply. Furthermore, the national statistics do not reflect the fact that increases in crude-oil stocks during 1943 occurred primarily in important producing districts, where they were not particularly needed, while there were withdrawals in several refining-consuming areas where stocks already were lower than desirable. Stocks of crude produced in Texas, Arkansas, Louisiana, and New Mexico were substantially increased, while some Illinois-Indiana and Kansas grade crudes also accumulated. But inventories of Pennsylvania grade and California and Rocky Mountain crudes were reduced.

Very importantly responsible for the current and prospective great demand for petroleum are the heavy wartime requirements of fuel oils and aviation gasoline, while manufacture of synthetic rubber, explosives, and many special war products also has perceptibly added to the over-all needs.

Especially noteworthy has been the overshadowing of gasoline by the fuel

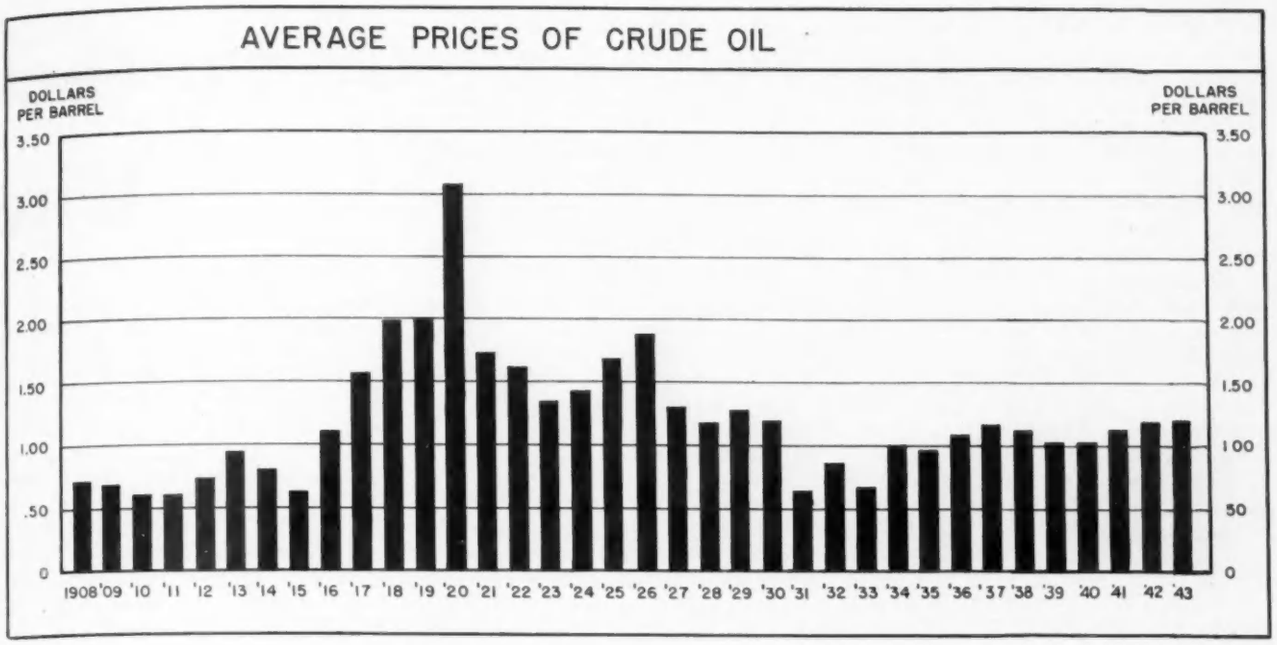
Total Demand, Domestic Production, and Changes in Stocks of All Oils, Crude Oil, and Principal Products

(Also Yields of the Principal Products from Crude)

BARRELS

ITEM	1941	1942	1943	Percent Change of 1943 From 1942	Percent Change of 1943 From 1941
All Oils:					
Total Demand During Year	1,578,300,000	1,548,800,000	1,657,200,000*	+ 7.0	+ 5.0
(Daily Average)	4,324,109	4,243,287	4,540,273*	+ 7.0	+ 5.0
Change in Stocks During Year	—10,949,000	—58,485,000	—8,164,000	.....	.....
Stocks End of Year	556,425,000	497,940,000	489,776,000	— 1.6	— 12.0
Crude Oil:					
Total Run to Stills	1,409,192,000	1,334,103,000	1,427,142,000*	+ 7.0	+ 1.3
(Daily Average)	3,861,000	3,655,000	3,910,000*	+ 7.0	+ 1.3
Total Demand for Domestic Crude	1,420,517,000	1,396,184,000	1,496,000,000*	+ 7.1	+ 5.3
(Daily Average)	3,892,000	3,825,000	4,099,000*	+ 7.1	+ 5.3
Domestic Run to Stills	1,358,300,000	1,319,500,000	1,416,000,000*	+ 7.3	+ 4.2
Exports, Fuel, and Losses	62,200,000	76,700,000	80,000,000	+ 4.3	+ 28.6
U. S. Production	1,402,228,000	1,386,645,000	1,501,903,000*	+ 8.3	+ 7.1
(Daily Average)	3,842,000	3,799,000	4,115,000*	+ 8.3	+ 7.1
Change in Stocks, Domestic	—18,300,000	—9,600,000	+7,000,000	.....	.....
Stocks End of Year, Total	257,678,000	245,754,000	249,226,000	+ 1.4	— 2.5
Refinable Crude	247,499,000	234,889,000	240,992,000	+ 2.6	— 2.4
Heavy in California	10,179,000	10,865,000	8,234,000	— 2.4	— 1.9
Motor Fuel:					
Total Demand	694,600,000*	624,200,000	623,000,000	— 0.2	— 10.3
(Daily Average)	1,903,014*	1,710,137	1,706,849	— 0.2	— 10.3
Production	701,294,000*	608,900,000	617,000,000	+ 1.3	— 12.0
(Daily Average)	1,921,353*	1,668,219	1,690,411	+ 1.3	— 12.0
Refinery Gasoline (Straight Run and Cracked)	623,285,000*	530,376,000	530,000,000	— 0.1	— 15.0
Natural Gasoline, etc.	84,290,000	85,719,000	95,000,000*	+ 10.8	+ 12.7
Less L.P.G. Sales, etc.	6,281,000	7,195,000	8,000,000	+ 11.2	+ 27.0
Change in Finished Gasoline Stocks During Year	+8,500,000	—15,400,000	—6,000,000	.....	.....
Stocks End of Year, Total Motor Fuel	90,596,000	75,404,000	69,919,000	— 7.3	— 22.8
Finished Gasoline	86,159,000	70,772,000	65,569,000	— 7.4	— 23.9
Natural Gasoline	4,437,000	4,632,000	4,350,000	— 6.1	— 2.0
Stocks End of Year, Finished and Unfinished Gasoline	94,098,000	80,116,000	76,302,000	— 4.7	— 18.8
(Unfinished Gasoline)	7,685,000	9,354,000	10,733,000	+ 14.7	+ 39.7
Yield from Crude	44.2%	39.8%	37.1%	— 6.8	— 16.1
Residual Fuel Oil:					
Total Demand	395,462,000	416,000,000	(?)475,000,000*	+ 14.2	+ 20.1
(Daily Average)	1,083,458	1,139,726	1,301,370*	+ 14.2	+ 20.1
Production	342,367,000	358,901,000	416,500,000*	+ 16.0	+ 21.7
(Daily Average)	937,992	983,290	1,141,096*	+ 16.0	+ 21.7
Change in Stocks During Year	5,067,000	21,176,000	12,687,000	— 40.1	+150.4
Stocks End of Year	82,959,000	61,783,000	49,096,000	— 20.5	— 40.8
Yield from Crude	24.3%	26.9%	29.2%	+ 8.6	+ 20.2
Distillate Fuel:					
Total Demand	192,600,000	208,000,000	(?)220,000,000*	+ 5.8	+ 14.2
(Daily Average)	527,671	569,863	602,740*	+ 5.8	+ 14.2
Production	189,177,000	196,714,000	211,600,000*	+ 7.6	+ 11.9
(Daily Average)	518,293	538,942	579,726*	+ 7.6	+ 11.9
Change in Stocks During Year	6,419,000	4,390,000	2,509,000	— 42.8	— 60.9
Stocks, End of Year	49,330,000	44,940,000	42,431,000	— 5.5	— 13.9
Yield from Crude	13.4%	14.7%	14.8%	+ 0.7	+ 10.4

* All-time record.



oils in relative importance of major products, from the standpoint of volumes required. The two groups almost exactly exchanged positions in 1943 as compared with 1941, in extension of the trend during 1942 toward lower gasoline yields and higher yields of distillate fuel and residual fuel.

From the crude oil processed during 1943, the yield of residual fuel oil was 29.2 percent and that of distillate fuel 14.8 percent, a total yield of 44 percent for the two products, compared with a yield of only 37.1 percent for motor fuel. In 1941 the combined yield of residual and distillate fuel oil was only 37.7 percent, while yield of motor fuel was 44.2 percent.

Thus the production of both the light and heavy fuel oils increased in 1943 to new all-time highs, after having shown important gains also in 1942; while motor fuel demand and production showed comparatively small change from the curtailed proportions of 1942 and therefore were more than 10 percent short of the all-time records established in 1941.

The accompanying page-wide table presents statistics for 1941, 1942, and 1943 on demand, production, stocks, and yields of these major products. And for 1944, it is indicated that there will be material increases in demand and production of motor fuel as well as the fuel oils.

In relation to current and prospective heavy demand, stocks of all of the major refined products are exceptionally low, following continued important withdrawals in 1943, as shown herewith on a chart. Stocks of the oils in all of the major categories represent further reduced number of days' supply at prevailing rates of consumption.

Furthermore, data for the industry as a whole do not bring out the fact that stocks in some districts are particularly low. The most serious deficiencies are those in California, where there have been sustained large withdrawals of practically all oils from storage. Outside of California, there was some net gain in the stocks of all oils during 1943, but the inventories had been comparatively low at the beginning of the year, following withdrawals generally in 1942; and even in 1943 there were important withdrawals of some products from storage in some districts. A 2-column table is published herewith, to show the distribution of the present stocks of the principal products by districts, compared with distribution of the inventories on hand a year ago and two years ago.

Stocks of Major Petroleum Products Held by Refining Companies in the United States at Beginning of Year, Compared with Year Ago and 2 Years Ago

(Stocks at Refineries, at Bulk Terminals, in Transit, and in Pipe Lines. Data from Weekly Reports of American Petroleum Institute)

THOUSANDS OF BARRELS

DISTRICT	Finished and Unfinished Gasoline (Stocks Beginning of Year)			Kerosine (Stocks Beginning of Year)			Gasoil and Distillate Fuel (Stocks Beginning of Year)			Residual Fuel Oil (Stocks Beginning of Year)		
	1942 (Jan. 3)	1943 (Jan. 2)	1944 (Jan. 1)	*1942 (Jan. 3)	*1943 (Jan. 2)	1944 (Jan. 1)	1942 (Jan. 3)	1943 (Jan. 2)	1944 (Jan. 1)	1942 (Jan. 3)	1943 (Jan. 2)	1944 (Jan. 1)
East Coast, Texas Gulf, La. Gulf, N. La.-Ark., and Inland Texas	43,429	36,613	34,497	6,446	6,991	5,376	29,422	21,985	22,336	25,114	12,468	16,543
Appalachian	3,781	2,901	3,004	311	337	406	438	735	1,007	533	488	352
Ind.-Ill.-Ky.	18,211	15,825	15,406	1,168	1,554	2,186	5,107	5,549	6,155	4,488	2,369	2,926
Okla.-Kans.-Mo.	8,813	6,720	7,115	618	576	703	1,477	1,927	2,000	2,297	1,376	1,018
Rocky Mountains	1,830	1,584	1,477	129	81	89	293	365	370	580	597	701
California	16,923	18,777	14,803	927	525	714	12,620	12,352	10,563	62,845	55,583	35,790
Total U. S.	92,987	82,420	76,302	9,599	10,064	9,474	49,357	42,913	42,431	95,857	72,881	57,330

* Bureau of Mines data for January 1.

Stocks of Crude Petroleum in the United States, by Grades, at Beginning of Year, Compared with Year Ago and 2 Years Ago

Data from weekly reports of U. S. Bureau of Mines

THOUSANDS OF BARRELS

GRADE OR ORIGIN	BEGINNING OF YEAR		
	1942 (January 3)	1943 (January 2)	1944 (January 1)
Pennsylvania Grade	3,630	2,960	2,437
Other Appalachian	1,424	1,340	1,529
Lima-Michigan	1,428	1,073	1,081
Illinois-Indiana	18,050	98,03	12,251
Arkansas	2,694	2,264	3,108
Kansas	7,356	7,004	7,684
Louisiana:	12,462	12,257	13,992
Northern	4,085	4,552	4,590
Gulf Coast	8,377	7,705	9,402
Mississippi	2,457	1,449	972
New Mexico	6,941	5,554	7,885
Oklahoma	51,894	39,118	32,921
Texas:	82,186	104,126	112,693
East Texas	21,034	25,483	23,776
West Texas	18,427	24,384	28,604
Gulf Texas	23,486	29,202	33,296
Other Texas	19,239	25,057	27,017
Panhandle	.....	4,914	6,566
North	.....	7,426	5,314
South	.....	4,712	5,728
Other	.....	8,005	9,409
Rocky Mountain	16,236	14,085	11,400
California	35,313	32,742	31,423
Foreign	2,369	163	1,616
Total Gasoline-bearing in U. S.	244,440	233,938	240,992
Heavy in California	10,136	10,585	8,234
Total U. S.	254,576	244,523	249,226

Further Due

WORLD production of crude oil almost certainly is due to increase materially in 1944 and reach a new all-time high, after having broken all previous records in 1943.

The production in 1944 apparently will be at least 10 percent greater than the unprecedented output of about 2,271,818,000 barrels (6,224,158 daily) indicated for 1943.

The output of 1943 itself was 10.8 percent above the indicated 2,055,000,000 barrels (5,630,137 daily) of 1942, which reflected serious interference with operations by war developments.

Even over the production of 2,247,249,000 barrels (6,156,847 daily) in 1941, when war had not yet brought its curtailment in the three leading producing countries, the United States, Russia, and Venezuela, as well as the East Indies, the output of 1943 showed an increase of 1.1 percent.

This gain in world production in 1943 over the former record output of 1941 reflected primarily the sharp stepping up of United States production, which more than compensated for all set-backs of 1942 throughout the world. The United States in 1943 produced 8.3 percent more crude than it did in 1942 and 7.1 percent more than in 1941. Putting out in 1943 a total of 1,501,903,000 barrels of crude (4,115,000 daily average), the wells of the United States accounted for approximately two thirds of total world production (66.1 percent). They had accounted for 67.4 percent of world output in 1942 and a normal proportion of 62.4 percent in 1941.

Similarly, the United States will be importantly instrumental in further expanding world production in 1944. The United States output in 1944 would be 7 percent above 1943 without any increase in production from current rates; and actually, there may be quite likely an increase of 10 percent or more in United States production, if there is enough drilling and rehabilitation of producing properties to make it possible.

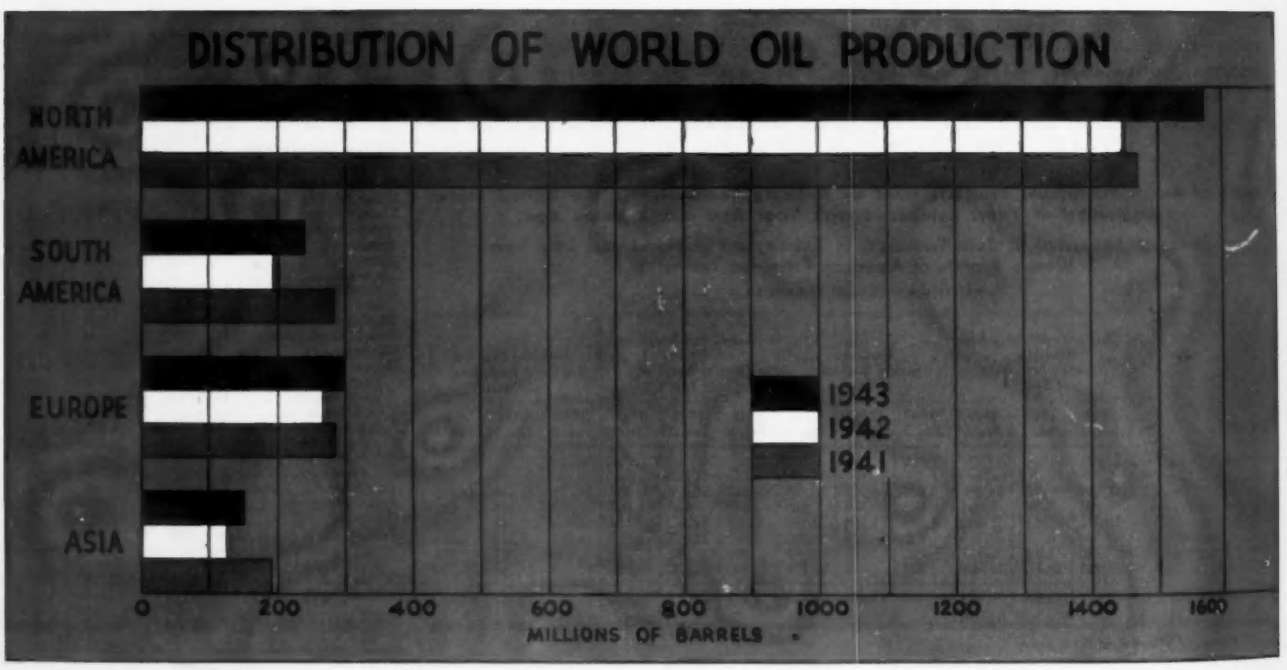
Outside the United States, too, some important or extraordinary increases in production are indicated for 1944. Venezuela, particularly, is due to loom larger than ever before in the world production picture, under the ambitious expansion program through which it will be called upon to supply great quantities to the United Nations, including relatively large exports to the United States as well as vast volumes for several of the theatres of war. Venezuela entered upon its expansion of production at the middle of 1943, as the United Nations effectively combated the Axis submarine menace, which had sharply curtailed Venezuelan exports; and for the year as a whole, production materially exceeded that of 1942, although it did not recover to the record of 1941. In 1944, however, Venezuela may be confidently expected to set a new record.

Colombia, similarly began recovering markets at mid-year of 1943 and produced more during the year than in 1942, although still materially less than in 1941; but may be expected to show a further large increase in 1944.

Argentina, third largest producing country of South America, has had no important wartime change in output and is not likely to experience any. The country imports petroleum, and will continue to satisfy requirements from domestic production in so far as possible.

Outside the Western Hemisphere, there have been during the past two years important changes in producing rates in both Europe and Asia, and further changes—especially increases—appear in store for 1944. Russia very likely will produce more oil in 1944 than ever before, after having recovered from the German invasion sufficiently in 1943 to approximately equal for the year the record production indicated for 1941. In 1942 Russian production was sharply curtailed when the Germans invaded the Maikop producing-refining district and disrupted oil movement by rail, through pipe lines to Rostov, up the Volga via Stalingrad, and to the Ukraine by Black Sea tankers fed at Batum by trans-Caucasus pipe lines delivering oils from Baku. But in 1943 the former annual rate of Russian production probably was approximated, in reflection of the recovery of lost territories, clearing of the Volga for river traffic, restoration of other transportation, and receipt of important quantities of needed oil-industry equipment from the United States via the Persian Gulf and Iran.

The outstanding change in Asiatic oil production in 1943 was the sharp increase of Iraq in the Near East, which reflected the reopening, early in the year, of the northern branch of the double pipe-line system to the Mediterranean,



Rise in World Production After 1943 Peak

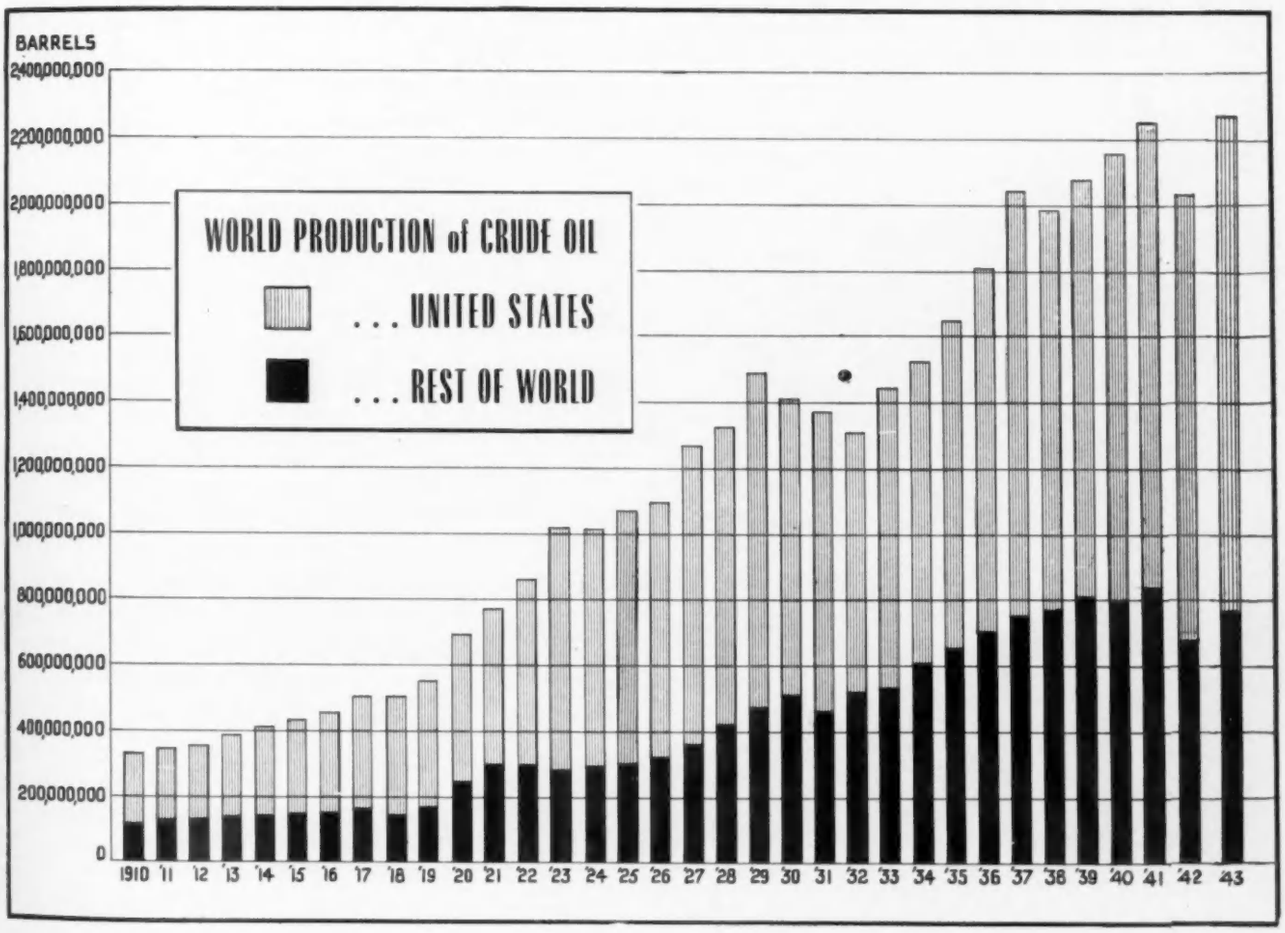
United States increases output and accounts for 8.3 percent more crude than in 1942, with better record in prospect in 1944; Venezuela looms large

terminating at Tripoli. With only the southern leg of the pipe line (to Haifa) in operation in 1942, Iraq produced in that year about 15,000,000 barrels, but in 1943 the volume of oil handled probably was increased more than 50 percent. Before the war, with the whole pipe-line system used, annual production was somewhat above 30,000,000 barrels, and equaling of the prewar rate is indicated for 1944.

Iran meanwhile has continued to produce at prewar rates in feeding the large refining facilities at Abadan, at the head of the Persian Gulf, which are called upon to supply heavy wartime and normal requirements in the Indian Ocean region. In 1943, Bahrein Island and Saudi Arabia, comparatively new but increasingly important oil producing countries, also at the head of the Persian Gulf, both equaled or exceeded production in other recent years; they very likely will be called upon for still more in 1944.

In the Far East, the principal proven oil fields, located in the East Indies, have been in the hands of the Japanese for two years, and guesses must serve as the best available statistics on production for 1943 as well as 1942. The United Nations did a good job of demolition of both refining and producing facilities before the Japanese gained control, early in 1942, and production during that year probably was negligible, outside of the output before the invasions. But by the end of 1943, the invaders had had nearly two years for rehabilitation, and during the year, the East Indies probably produced considerably more oil than in 1942, perhaps having met at least the needs of Japan's own refineries around the Sea of Japan, estimated to be able to process a minimum of over 50,000 barrels per day or 20,000,000 barrels yearly.

Left in the hands of the Japanese, the East Indies no doubt would be made to yield increased production in 1944, and similarly, if they should be regained by the United Nations, no time would be lost in restoring producing and refining capacity.



World Crude Oil Production, by Countries, by Years

(Complete production history of world, in thousands of barrels of 42 U. S. Gallons. *Sources: Mineral Resources* and *Minerals Yearbook*, except as otherwise indicated)

	NORTH AMERICA						SOUTH AMERICA							
YEAR...	Canada	Mexico	Trinidad	United States	Other North America	Total North America	Argentina	Bolivia	Colombia	Ecuador	Peru	Venezuela	Other South America	Total South America
1857.....														
1858.....														
1859.....				2		2								
1860.....				500		500								
1861.....				2,114		2,114								
1862.....	12			3,057		3,069								
1863.....	83			2,611		2,694								
1864.....	90			2,116		2,206								
1865.....	110			2,498		2,608								
1866.....	175			3,598		3,773								
1867.....	190			3,347		3,537								
1868.....	200			3,646		3,846								
1869.....	220			4,215		4,435								
1870.....	250			5,261		5,511								
1871.....	270			5,205		5,475								
1872.....	308			6,293		6,601								
1873.....	365			9,894		10,259								
1874.....	169			10,927		11,096								
1875.....	220			8,788		9,008								
1876.....	312			9,133		9,445								
1877.....	312			13,350		13,662								
1878.....	312			15,397		15,709								
1879.....	575			19,914		20,489								
1880.....	350			26,286		26,636								
1881.....	275			27,661		27,936								
1882.....	275			30,350		30,625								
1883.....	250			23,450		23,700								
1884.....	250			24,218		24,468								
1885.....	250			21,859		22,109								
1886.....	584			28,065		28,649								
1887.....	526			28,283		28,809								
1888.....	695			27,612		28,307								
1889.....	705			35,164		35,869								
1890.....	795			45,824		46,619								
1891.....	755			54,293		55,048								
1892.....	780			50,515		51,295								
1893.....	798			48,431		49,229								
1894.....	829			49,344		50,173								
1895.....	726			52,892		53,618								
1896.....	727			60,960		61,687					47			47
1897.....	710			60,476		61,186					71			71
1898.....	758			55,364		56,122					71			71
1899.....	808			57,071		57,879					89			89
1900.....	913			63,621		64,534					274			274
1901.....	757	10		69,389		70,156					275			275
1902.....	531	40		88,767		89,338					287			287
1903.....	487	75		100,461		101,023					278			278
1904.....	553	126		117,081		117,760					290			290
1905.....	634	251		134,717		135,602					373			373
1906.....	569	502		126,494		127,565					531			531
1907.....	789	1,005		166,095		167,889	[D]				751			751
1908.....	528	3,933	[D]	178,527		182,988	12				945			957
1909.....	421	2,714	57	183,171		186,363	18				1,411			1,429
1910.....	316	3,634	143	209,557		213,650	20				1,258			1,278
1911.....	291	12,553	285	220,449		233,578	13				1,465			1,478
1912.....	243	16,558	437	222,935		240,173	47				1,752			1,799
1913.....	228	25,696	504	248,446		274,874	131				2,071			2,202
1914.....	215	26,235	644	265,763		292,857	276				1,837			2,113
1915.....	215	32,911	750	281,104		314,980	513				2,579			3,092
1916.....	198	40,546	929	300,767		342,440	867				2,593			3,460
1917.....	214	55,293	1,602	335,316		392,425	1,218			57	2,577	120		3,972
1918.....	305	63,828	2,082	355,928		422,143	1,353			[E]60	2,527	333		4,273
1919.....	241	87,073	1,841	378,367		467,522	1,331			[E]60	2,628	425		4,444
1920.....	196	157,069	2,083	442,929		602,277	1,651			[E]60	2,817	457		4,985
1921.....	188	193,398	2,354	472,183		668,123	2,036		67	[E]60	3,699	1,433		7,295
1922.....	179	182,278	2,445	557,531		742,433	2,866		323	[E]60	5,314	2,201		10,764
1923.....	170	149,585	3,051	732,407		885,213	3,400		425	87	5,699	4,201		13,812
1924.....	161	139,678	4,057	713,940		857,836	4,639		445	[E]100	8,379	9,042		22,605
1925.....	332	115,515	4,387	763,743		883,977	6,336		1,007	160	9,232	19,687		36,422
1926.....	364	90,421	4,971	770,874		866,630	7,851		6,444	214	10,762	36,911		62,182
1927.....	477	64,121	5,380	901,129		971,107	8,630		15,014	537	10,127	63,134		97,442
1928.....	624	50,151	7,684	901,474		959,933	9,070		19,897	1,084	12,006	105,749		147,806
1929.....	1,117	44,688	8,716	1,007,323		1,061,844	9,391	[D]	20,385	1,381	13,422	137,472		182,051
1930.....	1,522	39,530	9,419	898,011		948,482	9,002	56	20,346	1,553	12,449	136,669		180,075
1931.....	1,543	33,039	9,744	851,081		895,407	11,709	25	18,237	1,762	10,089	116,613		158,435
1932.....	1,044	32,805	10,126	785,159		829,134	13,139	44	16,414	1,597	9,899	116,541		157,634
1933.....	1,145	34,001	9,561	905,656	23	950,386	13,691	112	13,158	1,620	13,257	117,720		159,558
1934.....	1,417	38,172	10,894	908,065	28	958,576	14,024	159	17,341	1,637	16,314	136,103		185,578
1935.....	1,447	40,241	11,671	996,596	47	1,050,002	14,297	164	17,598	1,732	17,067	148,254		199,112
1936.....	1,500	41,028	13,237	1,099,687	62	1,155,514	15,458	105	18,756	1,942	17,593	154,794		208,648
1937.....	2,944	46,907	15,503	1,279,160	33	1,344,547	16,355	122	20,599	2,161	17,457	186,230		242,924
1938.....	6,966	38,506	17,737	1,214,355	78	1,277,642	17,076	226	21,582	2,246	15,839	188,174		245,143
1939.....	7,838	42,898	19,270	1,264,962	112	1,335,080	18,613	215	23,857	2,313	13,508	206,470		264,976
1940[H].....	8,591	44,036	20,219	1,353,214	142	1,426,202	20,609	288	25,593	2,349	12,126	185,570		246,535
1941[H].....	[L]10,124	[L]42,895	21,211	[M]1,402,228	150	1,476,608	[L]22,013	230	24,553	1,557	11,922	223,784	3	284,062
1942[K].....	[L]10,365	[L]34,716	[N]24,500	[M]1,386,645	150	1,456,376	[L]23,742	250	10,590	1,900	[N]13,500	[N]145,000	30	195,012
1943[K].....	[L]9,958	34,500	25,000	1,501,905	200	1,571,563	23,500	250	13,750	2,000	14,000	187,000	40	240,540
Total...	94,879	2,103,161	272,494	28,097,196	1,025	30,568,755	294,897	2,246	326,381	30,289	303,457	2,630,087	73	3,587,430

[A] Included in India, British, prior to 1935. [B] Includes fields in Russian Asia other than Sakhalin. [C] Exclusive of U.S.S.R. fields in Asia, other than Sakhalin, which are included with U.S.S.R. in Europe. [D] Less than 1,000 barrels. [E] Approximate production. [F] No more data available. [G] Year Ended September 30. [H] All figures for 1940 and 1941, except as footnoted, from U.S.B. of M.'s "International Petroleum Trade", March 31, 1942. [I] Beginning of production in Brunei. [J] France's earlier production credited to Germany. [K] 1942 and 1943 estimated by The Oil Weekly, except as footnoted. [L] Government sources. [M] Revised B. of M. figure. [N] A.I.M.E. Transactions, 1943.

What's Behind the Trade Mark?

QUALITY

TRADE MARK

YOUNGSTOWN

SERVICE

Advance Against Depression

BANKERS wired caution. Friends of the company advised against it. But a farsighted management stood firm. Their idea of defense against depression was attack.

So started another phase of major expansion for The Youngstown Sheet and Tube Company - - in 1933, proposed for construction 79-inch continuous hot and cold strip mills, most advanced type to date, -- in 1934, a great seamless tube mill, first of its kind built in America in over 7 years.

In 1935, the new hot strip mill began to roll the steel that helped speed recovery--steel for millions of automobiles and trucks, refrigerators, ranges, washing machines, furniture, roofing, tin plate. Other continuous mills followed. Plant additions and improvements kept coming through all those lean years--to make better steel.

Thus Youngstown advanced, grew stronger, contributed to the nation's recovery from depression--- an opportunity better to serve America created by free enterprise. Only in a free economy could any company retain good profits made in good times to invest in jobs and improved equipment in bad times. Only under this system would a management be permitted to decide on a $25,000,000 expansion in a depression. And only with full restoration of free enterprise can American industry hope sucessfully to do its share of the colossal task of rebuilding world peace and prosperity after the war is won.

Historical Series - - - No. 11

CHARGING COLD SCRAP INTO ELECTRIC FURNACE

YOUNGSTOWN

THE YOUNGSTOWN SHEET AND TUBE COMPANY

YOUNGSTOWN, OHIO

Manufacturers of

CARBON - ALLOY AND YOLOY STEELS

Pipe and Tubular Products - Sheets - Plates - Conduit - Bars - Tin Plate
Rods - Wire - Nails - Tie Plates and Spikes - Alloy and Yoloy Steels

World Crude Oil Production, by Countries, by Years

(Complete production history of world, in thousands of barrels of 42 U. S. Gallons. *Sources: Mineral Resources* and *Minerals Yearbook*, except as otherwise indicated)

	EUROPE													AFRICA			
YEAR	Albania	Czechoslovakia	England	France	Germany	Austria	Hungary	Italy	Poland	Roumania	[B]U.S.S.R. (Russia)	Other Europe	[B]Total Europe	Egypt	Algeria	Other Africa	Total Africa
1857										2			2				
1858										4			4				
1859										4			4				
1860								D		9			9				
1861								D		17			17				
1862								D		23			23				
1863								D		28	41		69				
1864								D		33	65		98				
1865								2		39	67		108				
1866								1		42	83		126				
1867								1		51	120		172				
1868								D		56	88		144				
1869								D		59	202		261				
1870								D		84	204		288				
1871								D		90	165		255				
1872								D		91	185		276				
1873								D		104	475		579				
1874								1	150	103	583		837				
1875								1	158	108	697		964				
1876								3	164	111	1,321		1,599				
1977								3	170	108	1,801		2,082				
1878								4	176	109	2,401		2,690				
1879								3	215	110	2,761		3,089				
1880					9			2	229	115	3,001		3,356				
1881					29			1	287	122	3,601		4,040				
1882					58			2	330	136	4,538		5,064				
1883					27			2	365	139	6,002		6,535				
1884					46			3	408	211	10,805		11,473				
1885					41			2	465	193	13,925		14,626				
1886					74			2	306	168	18,006		18,556				
1887					74			1	344	182	18,368		18,969				
1888					85			1	467	219	23,049		23,821				
1889					68			1	515	298	24,609		25,491				
1890					108			3	659	383	28,691		29,844				
1891					109			8	631	488	34,573		35,809				
1892					101			18	646	593	35,775		37,133				
1893					100			19	693	535	40,457		41,804				
1894					123			21	949	508	36,375		37,976				
1895					121			26	1,453	576	46,140		48,316				
1896					145			18	2,444	543	47,221		50,371				
1897					166			14	2,226	571	54,399		57,376				
1898					184			15	2,376	776	61,610		64,961				
1899					192			16	2,314	1,426	65,955		69,903				
1900					358			12	2,347	1,629	75,780		80,126				
1901					314			16	3,251	1,678	85,168		90,427				
1902					354			19	4,142	2,060	80,540		87,115				
1903					446			18	5,235	2,763	75,591		84,053				
1904					637			26	5,947	3,599	78,537		88,746				
1905					561			44	5,766	4,421	54,960		65,752				
1906					579			54	5,468	6,378	58,897		71,376				
1907					757			60	8,456	8,118	61,851		79,242				
1908					1,009			51	12,612	8,252	62,187		84,111				
1909					1,019			42	14,933	9,327	65,970		91,291				
1910					1,032			51	12,673	9,724	70,337		93,817				
1911					1,017			75	10,519	11,108	66,184		88,903	21			21
1912					1,031			54	8,535	12,976	68,019		90,615	214			214
1913					857			47	7,818	13,555	62,834		85,111	98			98
1914					781			40	6,436	12,827	67,020		87,104	753	1		754
1915					703			44	5,352	12,030	68,548		86,677	212	4		216
1916					656			51	6,587	8,945	65,817		82,056	404	8		412
1917				[J]	642			41	6,228	3,721	63,072		73,704	943	9		952
1918				363	270			35	6,032	8,730	27,168		42,598	1,935	7		1,942
1919		48	2	334	265			35	6,096	6,618	31,752		45,150	1,517	5		1,522
1920		69	3	356	246			35	5,607	7,435	25,430		39,181	1,042	4		1,046
1921		94	3	389	274			32	5,167	8,368	28,968		43,295	1,255	3		1,258
1922		120	1	496	319			31	5,227	9,843	35,692		51,729	1,188	9		1,197
1923		74	1	494	346			34	5,402	10,867	39,147		56,365	1,054	9		1,063
1924		76	2	497	406			39	5,657	13,369	45,355		65,401	1,122	11		1,133
1925		158	3	459	541			61	5,960	16,650	52,448		76,280	1,226	12		1,238
1926		150	2	478	653			41	5,844	23,314	64,311		94,793	1,188	9		1,197
1927		112	2	504	663			47	5,342	26,368	77,018		110,056	1,267	8		1,275
1928		94	1	512	630			46	5,492	30,773	[G]84,745		122,293	1,842	8		1,850
1929		93		535	704			45	4,988	34,758	[G]99,507		140,630	1,868	20		1,888
1930		157	D	523	1,182			59	4,904	41,624	[G]125,555		174,004	1,996	16		2,012
1931		134	F	520	1,606			124	4,662	49,127	162,842		219,015	2,038	F		2,038
1932		126	F	530	1,608			208	4,116	53,815	154,367		214,770	1,895	F		1,895
1933	11	122	F	562	1,665			204	4,072	54,020	154,840		215,496	1,663	F		1,663
1934	10	178	F	557	2,187			151	3,913	62,063	174,318		243,377	1,546	F		1,546
1935	41	133	F	541	2,996	44		119	3,812	61,310	182,386	2	251,384	1,301	F	4	1,305
1936	273	127	F	503	3,115	50		123	3,789	63,659	186,206	1	257,846	1,278	F	4	1,282
1937	619	123	F	502	3,176	221	16	110	3,716	52,452	193,241	4	254,180	1,196	F	22	1,218
1938	752	130	F	513	3,861	383	288	101	3,763	48,487	204,956	9	263,243	1,581	F	27	1,608
1939	934	120	F	500	4,487	693	1,103	91	3,898	45,483	216,866	10	274,185	4,666	F	27	4,693
1940[H]	1,497	119	F	496	4,544	719	1,755	57	3,891	42,182	218,600	10	273,870	6,053	F	27	6,080
1941[H]	1,381	109	F	479	4,438	692	2,474	46	3,319	38,147	238,150	10	289,245	7,659	F	27	7,686
1942[K]	1,450	120	F	500	5,000	700	3,800	50	[N]3,400	[N]41,000	[N]212,000	10	268,030	8,000	F	25	8,025
1943[K]	1,100	125	F	600	6,500	800	5,000	35	3,500	42,000	240,000	10	299,670	8,500	F	25	8,525
Total	8,068	2,911	20	12,743	66,295	4,302	14,436	2,898	273,014	1,035,140	5,095,539	66	6,515,432	68,521	143	188	68,852

[A] Included in India, British, prior to 1935. [B] Includes fields in Russian Asia other than Sakhalin. [C] Exclusive of U.S.S.R. fields in Asia, other than Sakhalin, which are included with U.S.S.R. in Europe. [D] Less than 1,000 barrels. [E] Approximate production. [F] No more data available. [G] Year Ended September 30. [H] All figures for 1940 and 1941, except as footnoted, from U.S.B. of M.'s "International Petroleum Trade", March 31, 1942. [I] Beginning of production in Brunei. [J] France's earlier production credited to Germany. [K] 1942 and 1943 estimated by The Oil Weekly, except as footnoted. [L] Government sources. [M] Revised B. of M. figure. [N] A.I.M.E. Transactions, 1943.

We can't lose time when we beat swords into plowshares

Peace will bring many complex world problems—political, social, and economic. But there are fundamental realities which this country must face.

Jobs! Jobs for millions of returned soldiers—for millions of ex-war workers.

Food! Food for the millions of undernourished or starving peoples in war ravaged lands.

Consumer goods! Fabrics, materials of metals and plastics, farm machinery, household appliances.

To supply the great postwar demands, American manufacturers must scrap old machines and equip with up-to-date machinery, or find themselves far behind in the race for domestic and foreign markets.

The truth is a large part of America's war materials is being produced on machines that were old at the start of the war and will be worn out and have to be replaced to meet the vast production demands of peacetime. Thousands of factories in America, in spite of war work, have not fully replaced old machines.

We had little time to convert to war—we'll have little time to convert to peace. Plan, and save precious time now.

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Warner & Swasey offers you practical help on postwar planning. We have a corps of engineers who are skilled in *all* machine operations involved in production of precision parts made of metal. They are helping many war plants improve methods and machines for greater production. They will continue to do so, but their services are also available for management interested in planning *now* for the future. Write Warner & Swasey, Cleveland 3, O.

YOU CAN TURN IT BETTER, FASTER, FOR LESS . . . WITH A WARNER & SWASEY

World Crude Oil Production, by Countries, by Years

(Complete production history of world, in thousands of barrels of 42 U. S. Gallons. *Sources: Mineral Resources and Minerals Yearbook*, except as otherwise indicated)

	ASIA																
YEAR	Bahrein Island	[A]Burma	India, British	Iran (Persia)	Iraq	Japan (Incl Taiwan)	Netherland India	Sakhalin	Br. Borneo (Sarawak & Brunei)	Saudi Arabia	Other Asia	[C]Total Asia	Australia and New Zealand	World Undistributed	World Total	Percent Pro. by U.S.
1857															2	
1858															4	
1859															6	
1860															509	31
1861															2,131	99
1862															3,092	99
1863															2,763	94
1864															2,304	92
1865															2,716	92
1866															3,899	92
1867															3,709	90
1868															3,990	91
1869															4,696	90
1870															5,799	91
1871															5,730	91
1872															6,877	92
1873															10,838	91
1874															11,933	92
1875						5						5			9,977	88
1876						7						7			11,051	83
1877						10						10			15 754	85
1878						18						18			18,417	84
1879						23						23			23,601	84
1880						26						26			30,018	88
1881						17						17			31,993	88
1882						15						15			35,704	85
1883						20						20			30,255	78
1884						28						28			35,969	67
1885						30						30			36,765	59
1886						38						38			47,243	59
1887						29						29			47,807	59
1888						37						37			52,165	53
1889			94			53						147			61,507	57
1890			118			52						170			76,633	60
1891			190			53						243			91,100	60
1892			242			69						311			88,739	57
1893			299			106	600					1,005			92,038	53
1894			327			173	688					1,188			89,337	55
1895			372			170	1,216					1,758			103,692	51
1896			430			237	1,427					2,094			114,199	53
1897			546			262	2,552					3,360			121,993	50
1898			542			319	2,964					3,825			124,979	44
1899			941			539	1,796					3,276			131,147	44
1900			1,079			871	2,253					4,203			149,137	43
1901			1,431			1,117	4,014					6,562		20	167,440	41
1902			1,617			996	2,430					5,043		26	181,809	49
1903			2,510			1,209	5,770					9,489		36	194,879	52
1904			3,385			1,219	6,508					11,112		40	217,948	54
1905			4,137			1,347	7,850					13,334		30	215,091	63
1906			4,016			1,564	8,181					13,761		30	213,263	59
1907			4,344			1,718	9,983					16,045		30	263,957	63
1908			5,047			1,871	10,283					17,201		30	285,287	63
1909			6,677			1,887	11,042					19,606		20	298,709	61
1910			6,138			1,829	11,031					18,998		20	327,763	64
1911			6,451			1,737	12,173					20,361		20	344,361	64
1912			7,117			1,659	10,846					19,622		20	352,443	63
1913			7,930	1,857		1,940	11,172		141			23,040		20	385,345	64
1914			7,410	2,910		2,636	11,422		318			24,696		20	407,544	65
1915			8,202	3,616		2,928	11,920		392			27,058		10	432,033	65
1916			8,491	4,477		2,963	12,547		629			29,107		25	457,500	66
1917			8,079	7,147		2,861	13,180		542			31,809		29	502,891	67
1918			8,188	8,623		2,441	12,778		504			32,534		25	503,515	71
1919			8,736	10,139		2,238	15,508		596			37,217		20	555,875	68
1920			8,375	12,230		2,221	17,529		1,020			41,375		20	688,884	64
1921			8,734	16,673		2,233	16,958	2	1,411			46,011		20	766,002	63
1922			8,529	22,247		2,055	17,066	7	2,849			52,753		22	858,898	65
1923			8,406	25,230		1,804	19,870	9	3,940			59,259		24	1,015,736	72
1924			8,416	32,373		1,814	20,473	80	4,163			67,319		24	1,014,318	70
1925			8,274	35,038		1,915	21,422	87	4,257			70,993		23	1,068,933	71
1926			8,011	35,842		1,785	21,243	181	4,942			72,004		17	1,096,823	70
1927			8,032	39,688	338	1,789	27,459	440	4,943			82,689		13	1,262,582	71
1928			8,741	43,461	713	1,944	32,118	677	[I]5,223			92,877		15	1,324,774	68
1929			8,747	42,145	798	2,023	39,279	[G]1,134	5,290			99,416		38	1,485,867	66
1930			8,292	45,828	913	1,950	41,729	[G]1,805	4,907			105,424		40	1,410,037	64
1931			8,200	44,376	830	2,050	35,539	2,734	3,854			97,583		54	1,372,532	62
1932			8,817	49,471	836	1,630	39,001	2,631	3,796			106,182		62	1,309,677	60
1933	31		8,743	54,392	917	1,455	42,606	2,338	4,490			114,972		71	1,442,146	63
1934	285		10,503	57,851	7,689	1,834	46,925	2,881	5,140			133,108		96	1,522,281	60
1935	1,265	7,181	2,038	57,273	27,408	2,249	47,171	2,545	5,546			152,676	5	4	1,654,488	60
1936	4,645	7,588	1,978	62,718	30,406	2,440	50,025	3,212	5,209	20		168,241	5	4	1,791,540	61
1937	7,762	7,848	2,162	77,804	31,836	2,488	56,724	3,656	6,009	65		196,354	4	4	2,039,231	63
1938	8,298	7,538	2,488	78,372	32,643	2,511	57,318	[E]3,821	6,913	495		200,397	4	4	1,988,041	61
1939	7,589	7,873	2,327	78,151	30,791	2,654	62,087	[E]4,000	7,097	3,934		206,503	3	4	2,085,444	61
1940[H]	7,074	7,731	2,250	66,900	24,225	2,639	62,011	[E]4,000	7,047	5,365		189,242	3	14	2,141,946	63
1941[H]	6,794	7,762	2,270	[N]78,000	12,650	[N]3,300	[N]62,120	[E]4,000	6,864	5,871		189,631	3	14	2,247,249	62.4
1942[K]	[N]7,800	[N]2,400	[N]2,500	[N]76,000	[N]14,800	[N]3,400	[N]9,000	5,000	[N]1,500	6,000		128,400	5	15	2,055,863	67.4
1943[K]	8,000	1,000	3,000	78,000	23,500	3,500	20,000	5,000	3,000	6,500		151,500	5	15	2,271,818	66.1
Total	59,543	56,921	264,919	1,248,832	241,293	93,050	1,067,807	50,240	112,532	28,250		3,223,387	37	1,088	43,964,981	63.9

[A] Included in India, British, prior to 1935. [B] Includes fields in Russian Asia other than Sakhalin. [C] Exclusive of U.S.S.R. fields in Asia, other than Sakhalin, which are included with U.S.S.R. in Europe. [D] Less than 1,000 barrels. [E] Approximate production. [F] No more data available. [G] Year Ended September 30. [H] All figures for 1940 and 1941, except as footnoted, from U.S.B. of M.'s "International Petroleum Trade", March 31, 1942. [I] Beginning of production in Brunei. [J] France's earlier production credited to Germany. [K] 1942 and 1943 estimated by The Oil Weekly, except as footnoted. [L] Government sources. [M] Revised B. of M. figure. [N] A.I.M.E. Transactions, 1943.

State's spurt late in 1943 responsible for nation's all-time peak annual petroleum output; PAW District 3 accounts for 57 percent at end of year with prospects good for more in 1944

Texas to Dominate Industry To a Larger Degree in 1944

OPERATIONS of the United States' petroleum industry will be dominated by Texas during 1944 to a greater degree than ever before. It was this state's big upward surge in crude production during the last half of 1943 that was mostly responsible for the nation's all-time peak annual petroleum output, and Texas also was the chief contributor to the upswing in completion rates that by last fall had sent drilling activity above levels of the preceding year. At the end of 1943, Texas was accounting for a substantially larger share of the nation's production and well completions than at the start of the year, indicating that it will certainly be a greater factor than in any previous year, especially since further gains in both Texas production and drilling are anticipated.

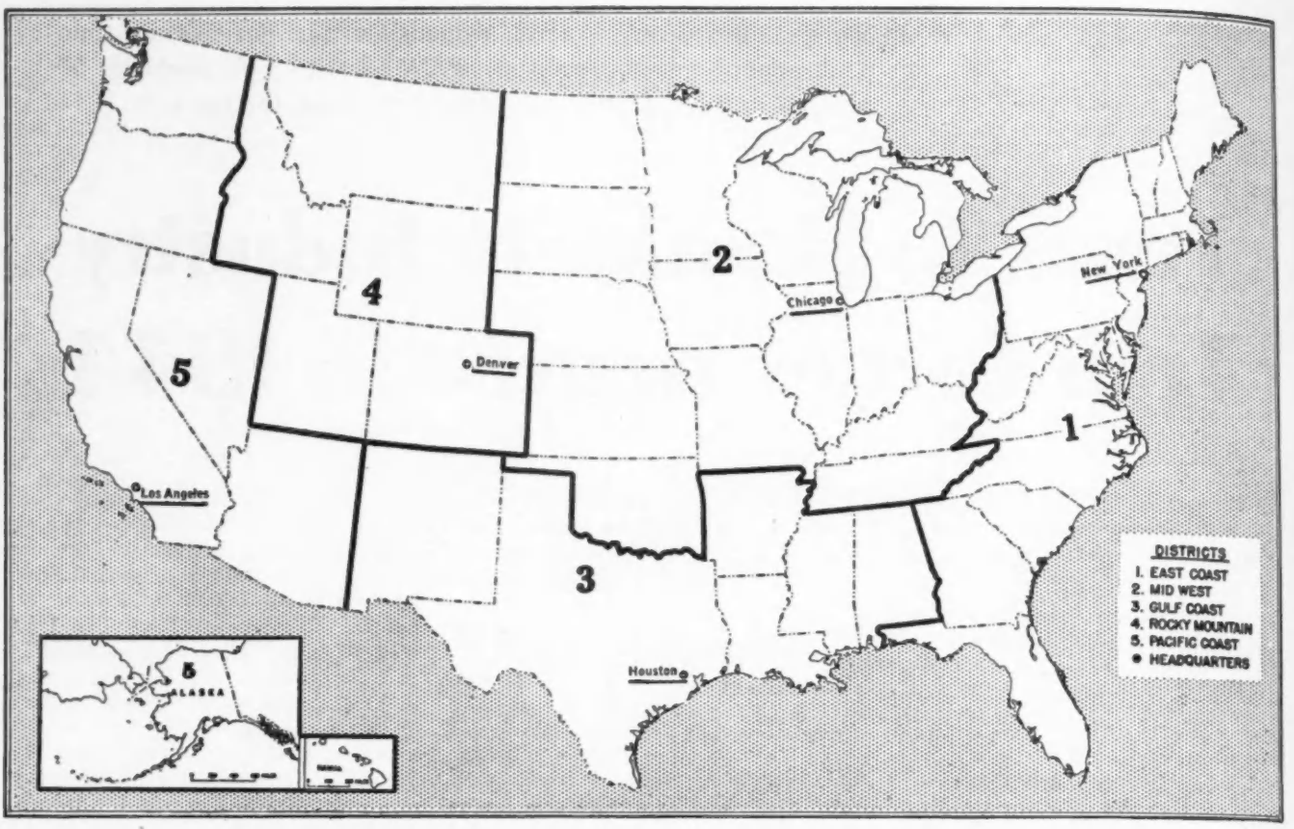
Depends Upon Texas

If the United States produces enough oil during 1944 to meet consumption needs, it will be because of further gains in Texas. Few other areas are thought to be capable of producing larger quantities, and these to a much smaller extent than Texas, while several states and regions will of necessity produce less.

At the end of 1943, this state was producing 1,892,700 barrels of crude oil daily, exclusively of distillate, a commodity in which it also leads the nation. This daily output was half a million barrels above its December, 1942, rate, whereas the nation's increase in daily output was slightly smaller due to decreases in some areas. The state was contributing 43.4 percent of the nation's crude oil in contrast with 35.8 percent in December, 1942. When pipeline outlets to West Texas are finished next spring, Texas will produce at least another 100,000 barrels per day. This is the only region in the nation certain

Comparative Location of United States Production and Drilling Activity During 1942-1943 and Currently with Year Ago

	Daily Average Crude Oil Production		Annual Crude Oil Production		Well Completions				PERCENT OF NATIONAL TOTAL							
									Crude Production				Well Completions			
									Daily End of		For Year		In December		For Year	
	End of 1943	End of 1942	Year 1943	Year 1942	Dec. 1943	Dec. 1942	Year 1943	Year 1942	1943	1942	1943	1942	1943	1942	1943	1942
District 1:																
New York	13,000	14,000	5,001,000	5,421,000	99	91	1,241	1,228	0.3	0.4	0.3	0.4	5.8	5.9	6.5	5.7
Pennsylvania	40,200	47,400	15,641,000	17,779,000	186	218	2,529	3,845	0.9	1.2	1.1	1.3	10.9	14.1	13.2	17.9
West Virginia	8,500	8,900	3,338,000	3,574,000	86	69	717	764	0.2	0.2	0.2	0.3	5.1	4.4	3.7	3.6
Others	.....	.....	.....	.....	1	....	9	3	....	....	....	....	....	....	....	....
Total	61,700	69,300	23,980,000	26,774,000	373	378	4,496	5,840	1.4	1.8	1.6	2.0	21.8	24.4	23.4	27.2
District 2:																
Illinois	214,550	244,000	82,067,000	106,391,000	156	184	1,812	2,144	4.9	6.3	5.5	7.7	9.2	11.9	9.4	10.0
Indiana	12,750	15,450	5,249,000	6,743,000	40	44	305	395	0.3	0.4	0.3	0.5	2.3	2.9	1.6	1.8
Kansas	270,200	293,050	106,060,000	97,636,000	150	128	1,748	1,618	6.2	7.6	7.1	7.0	8.8	8.3	9.1	7.5
Kentucky	23,100	15,300	7,903,000	4,534,000	39	13	427	168	0.5	0.4	0.5	0.3	2.3	0.9	2.2	0.8
Michigan	50,250	59,550	20,663,000	21,754,000	59	33	604	666	1.2	1.5	1.4	1.6	3.5	2.1	3.2	3.1
Ohio	8,800	9,000	3,277,000	3,543,000	30	98	737	1,134	0.2	0.2	0.2	0.2	1.8	6.3	3.8	5.3
Oklahoma	326,800	356,350	122,740,000	140,690,000	124	164	1,466	1,454	7.5	9.2	8.2	10.1	7.3	10.6	7.6	6.8
Nebraska	1,600	3,000	669,000	1,237,900	2	....	39	28	....	0.1	....	....	0.1	0.0	0.4	0.3
Others	.....	.....	48,000	45,000	2	2	9	9	....	....	....	....	0.1	0.1	....	....
Total	908,050	995,700	348,676,000	382,573,000	602	666	7,175	7,650	20.8	25.7	23.2	27.4	35.4	43.1	37.3	35.6
District 3:																
Arkansas	79,200	73,650	27,570,000	26,628,000	21	21	259	230	1.8	1.9	1.8	1.9	1.2	1.3	1.3	1.1
Alabama	.....	.....	.....	.....	.....	.....	2	3	....	....	....	....	....	....	....	....
Louisiana	353,800	315,050	123,909,000	115,785,000	33	52	667	913	8.1	8.1	8.2	8.3	1.9	3.4	3.5	4.3
Mississippi	47,250	58,950	18,989,000	28,833,000	....	4	87	101	1.1	1.5	1.3	2.1	0.0	0.3	0.5	0.5
New Mexico	112,900	94,500	38,493,000	31,544,000	26	28	271	384	2.6	2.5	2.6	2.3	1.5	1.8	1.4	1.8
Texas	1,892,700	1,386,600	592,884,000	483,097,000	457	291	4,370	5,198	43.4	35.8	39.5	34.8	26.9	18.8	22.7	24.2
Total	2,485,850	1,928,750	801,845,000	685,887,000	537	396	5,656	6,829	57.0	49.8	53.4	49.4	31.5	25.6	29.4	31.9
District 4:																
Colorado	7,100	6,700	2,347,000	2,199,000	10	1	34	15	0.2	0.2	0.2	0.2	0.6	0.0	0.2	0.1
Montana	20,450	22,600	7,757,000	8,074,000	34	7	242	193	0.5	0.6	0.5	0.6	2.0	0.5	1.3	0.9
Wyoming	89,250	90,850	33,413,000	32,812,000	15	3	126	98	2.0	2.3	2.2	2.4	0.9	0.2	0.6	0.4
Others	.....	.....	5,000	.....	.....	.....	.....	.....	....	....	....	....	....	....	....	....
Total	116,800	120,150	43,522,000	43,085,000	59	11	402	306	2.7	3.1	2.9	3.2	3.5	0.7	2.1	1.4
District 5:																
California	792,700	762,500	283,880,000	248,326,000	131	95	1,477	826	18.1	19.6	18.9	17.9	7.7	6.1	7.7	3.9
Others	.....	.....	.....	.....	.....	.....	5	3	....	....	....	....	....	....	....	....
Total	792,700	762,500	283,880,000	248,326,000	131	95	1,482	829	18.1	19.6	18.9	17.9	7.7	6.1	7.7	3.9
Total:																
United States	4,365,100	3,876,400	1,501,903,000	1,386,645,000	1,701	1,546	19,212	21,454	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0



ADMINISTRATIVE DISTRICTS OF THE PETROLEUM ADMINISTRATION FOR WAR

to produce greater volumes from existing wells.

Because the state was the scene of the discovery of more new fields during 1943 than any other, and because it has more proved undrilled locations than any other, Texas is likely to experience a sharp upward trend in drilling if restrictions on these operations are relaxed to any marked degree. Texas completed fewer wells during 1943 than in 1942, due to a slow start. However, during the latter part of the year it made up much of its lost ground, and in December, 1943, was accounting for 26.9 percent of the nation's completions in contrast with only 18.8 percent in December of the preceding year. It was this late gain in Texas that pushed the national total over rates of a year ago, and a continuation of current completion rates will result in the completion of more than 5250 completions in 1944. Meanwhile companies have indicated (see page 84) that Texas may account for 6612 completions in 1944, exclusive of deepening operations, input and disposal wells.

District 3 Top Region

Because of the dominant position of Texas, the Southwestern group of states, known as PAW District 3, was the most important region in the national oil picture, and promises to be of greater significance during the coming year.

District 3 includes Texas, Louisiana, New Mexico, Arkansas, Mississippi and Alabama, all important oil-producing and drilling regions except for the latter state.

By the end of 1943, District 3 was producing 57 percent of the nation's daily oil production, in contrast with 49.8 percent at the end of 1942. All the other four districts were producing a smaller percentage of the national total than a year ago, and only one was producing more barrels of oil. Daily production of District 3 totaled almost 2½ million barrels daily in December, 1943, which was more than half a million barrels greater than 12 months previous. This gain in daily output was slightly greater than the increase of the whole nation. With further gain anticipated for Texas, District 3 may produce 60 percent of the United States' output in 1944.

While Texas is largely responsible for the importance of District 3, other states in the area produced more oil in 1943 than in 1942, and therefore contributed partially to the growing importance of the region. Four out of nine states that produced more oil during 1943 than in 1942, are in this district. Louisiana, Arkansas and New Mexico produced more oil during 1943 than in the preceding year, and also were producing more oil at the end of this year than a year ago. However, their rate of increase was about in proportion to the nation's gain, and therefore they were producing about the same percent of the national total.

District 3 also should account for a larger portion of the well completions in 1944. One fourth of the well completions in December, 1942, were in District 3, and this had increased to almost one third by the end of 1943.

District 5 Gains Sharply

The second most important regional gain in production and drilling occurred in District 5 (California). This state surprised many with the production rate it maintained throughout the year, but there is serious doubt that it can produce much more than currently. Consequently, it cannot hope to meet Pacific military requirements when fighting in that area becomes more intensive.

During 1943, California produced 35 million more barrels than in 1942, and consequently was responsible for 18.9 percent of the national total as compared with 17.9 percent in the preceding year. At the close of the year, this state was producing 30,000 barrels more oil per day than a year ago, but because of the sharper gain in national output was accounting for but 18.1 percent of the United States total as compared with 19.6 percent at the end of 1942.

California had the most remarkable gain in drilling activity of any region, completing 1477 wells in 1943 against a

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1942 total of 826. Consequently, it contributed 7.7 percent of the nation's completions as compared with only 3.9 percent in 1942. This high rate of drilling is expected to continue.

District 2 Slumps

The Middle-West and Mid-Continent states that comprise PAW District 2 suffered a severe loss in production, as its three most important states were producing less at the end of the year than at the beginning. Illinois, which produced only 82 million in 1943 compared with 106 million in 1942, was producing but 214,550 barrels daily at the end of 1943 in contrast with a daily output of 244,000 barrels a year before. Oklahoma produced 28 million barrels less in yielding but 122,740,000 barrels during 1943, and was producing 30,000 barrels less per day at the close of the year than a year previous. Kansas was producing 23,000 barrels less per day at the end of the year, although its annual production was up slightly due to a larger recovery in the forepart of the year.

As a result of declines in its three most important states, District 2 was producing almost 90,000 barrels less per day than a year ago, and its prospects for the coming year are not bright. The problem of how to supply crude oil to the refineries in District 2 is one reason the building of Stanolind Pipe Line Company's line from West Texas to Drumright, Oklahoma, is considered so important.

Drilling also slumped sharply in the territory, and does not appear exceptionally bright for the future.

District 4 Outlook Improved

The Rocky Mountain States, which comprise PAW District 4, produced only little more oil in 1943 than in 1942, and were producing less per day at the close of the year. However, some important new fields were found, and new pipe lines are to be built. This area may produce more oil during 1944 than in 1943, and may also account for more of the drilling. Principal contributor to any gain in District 4 will be its largest oil state, Wyoming.

District 1 Declining

The Eastern Seaboard area, which makes up PAW District 1, has as its oil-producing members the Appalachian States, which are the oldest settled production in the country. This territory produced less and drilled less in 1943 than in 1942, and can look forward to the coming year without much hope of improvement. It still accounts for a sizeable share of the nation's drilling, and if materials are made available, and sufficiently high crude prices to encouraging secondary operations are permitted, it may show some improvement, especially in the matter of drilling. At the end of the year it was contributing but 1.4 percent of the nation's daily oil production, although recording 21.8 percent of the completions.

Grateful Acknowledgment to Many Helpers

IN PREPARING the many forecasts, surveys, facts and figures that appear in this Yearbook-Forecast Number, THE OIL WEEKLY has had the generous assistance of many oil and gas companies, state oil and gas agencies, and numerous individuals. Their help has been of immeasurable value, and we take this occasion to publicly acknowledge our gratitude.

In addition to many outside our organization, every member of THE OIL WEEKLY'S editorial staff has participated in gathering material and data for practically virtually every one of the articles presented in this issue. The compilation and assembly of all the different reports into tables covering the nation, which is a tremendous undertaking, has been under the direction of L. J. Logan, associate editor in charge of economics.

A larger number of companies, agencies, associations and individuals furnished requested data on both past developments and outlook trends than ever before. Their help was particularly valuable in compiling facts and figures on drilling prospects and pumping equipment needs, crude oil reserves, production records and pipe-line construction.

Special attention should be called to two annual surveys which have become widely anticipated features of the Yearbook-Forecast Number. These are (1) forecast of the number of wells and footage to be drilled during the year ahead and (2) outline of the industry's expected needs during the next 12 months for new and replacement lifting equipment. More than 125 company executives, engineers, superintendents, and others, from all over the United States, contributed to these two studies. So many companies and company executives and operatives contributed that they cannot be listed individually, and many requested that their aid remain anonymous. Their cooperation is really appreciated, however.

Data on well completions, wildcatting and footage drilled have originated largely from weekly drilling reports of oil companies, to which district staff representatives are permitted access throughout the year; the coordination of the data being carried out by THE OIL WEEKLY'S statistical department as the year unfolds. In some instances, these reports are supplemented by data from various state oil and gas conservation departments and geological surveys, including those of Illinois, Indiana, Missouri, Tennessee, Arkansas and Florida. Valuable data on well completions also are obtained from the California division of the American Petroleum Institute, and from the Bradford District Pennsylvania Oil Producers Association.

In order to present information on number of wells producing oil, by states, with breakdown by flowing and artificial-lift methods, at a date this early in the new year, special assistance is asked of various state departments and individuals.

Compilation of data on new oil proved or developed during the year involves laborious effort on the part of all district editorial men, but again the undertaking is facilitated by the generous assistance of men of the industry.

Similarly, special work is involved for staff men and their oil friends in obtaining and compiling other statistical data presented in this book.

Among those whose help has been given freely are various PAW officials, among them Donald R. Knowlton, Frank A. Watts and district organizations, the Arkansas Oil & Gas Commission, A. H. Bell, head of the oil and gas division, Illinois State Geological Survey; F. R. Frye, supervisor of wells, Michigan Department of Conservation; Kendall E. Born, assistant state geologist, Tennessee; H. A. Buehler, director, and Frank C. Greene, geologist, Missouri Geological Survey; R. P. Jackson, secretary, Oil Conservation Board of Montana; John M. Kelly, director, New Mexico Oil Conservation Commission; Glen Staley, New Mexico oil umpire's office; David B. Reger, consulting geologist, Morgantown, West Virginia; Kenneth Cottingham, geologist, Ohio Fuel Gas Company, Columbus, Ohio; Ralph T. Zook, Bradford, Pennsylvania; Brad Mills, executive secretary, American Association of Oil Well Drilling Contractors; and others, including many drilling contractors.

Other features in this issue reflect the additional assistance of some of the individuals and organizations just mentioned and also the help of many others, including the following: R. C. Tucker, acting state geologist, Morgantown, West Virginia; Conservation Committee of California Oil Producers; the Texas Railroad Commission; D. T. Ring, vice president, Preston Oil Company, Columbus, Ohio; the oil conservation departments of the Oklahoma Corporation Commission, and Kansas Corporation Commission; W. W. Dunlap, Pennsylvania Grade Crude Oil Association, Oil City, Pennsylvania; P. Hastings Keller, in charge, oil and gas section, Indiana Department of Conservation; G. W. Holbrook, president, New York State Oil Producers Association, Wellsville, New York; C. A. Hartnagel, state geologist, and John G. Broughton, assistant state geologist, Albany, New York; Roy Yarbrough, New Mexico Oil Conservation Commission, Hobbs, New Mexico; Alec M. Crowell, director, and E. M. Dutton, auditor, Arkansas Oil & Gas Commission; H. M. Morse, state oil and gas supervisor, Jackson, Mississippi; and district offices of the Louisiana Department of Conservation headed by Peter A. Huth, New Orleans; Dave J. Robichaux, Houma; D. D. Gooch, Lafayette; Frank J. Fava, Lake Charles; C. B. Smitherman, Shreveport; and Duncan S. Cook, Monroe.

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Reserves Decline as Less New Oil Discovered Than Produced

Quantity of new oil estimated discovered during 1943 lacks a third of a million barrels of equaling record production

THE United States found and proved the existence of 1,174,363,000 barrels of new oil during 1943, which, however, was 327,540,000 barrels less than its record production of 1½ billion barrels, according to a study made by THE OIL WEEKLY editorial staff.

This net loss reduced total known underground reserves of petroleum as of the end of 1943 to 19,755,253,000 barrels, when figures for preceding years are revised to conform to estimates made by the American Petroleum Institute, which group had calculated known reserves remaining at the close of 1942 as being 20,082,793,000 barrels.

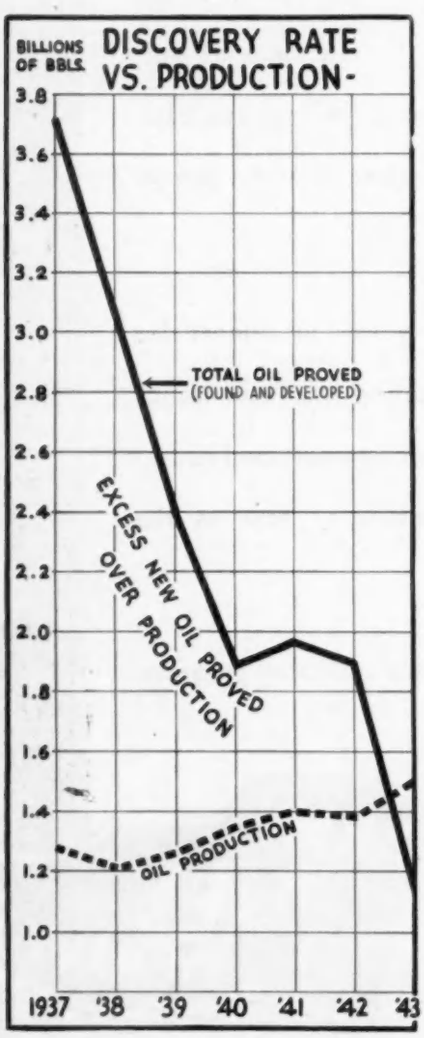
The 1,174,363,000 barrels of new oil estimated by this publication to have been proved during 1943 is considerably lower than figures of the American Petroleum Institute for preceding years. It compares with the institute's figures of 1,878,976,000 barrels proved during 1942; 1,968,963,000 barrels proved in 1941; and 1,893,350,000 barrels proved in 1940. The year 1943, as a result, appears to be the least favorable discovery period in at least 10 years, and for the first time during this era production exceeded the volume of new oil discovered in new pools, new pays, extensions and field development.

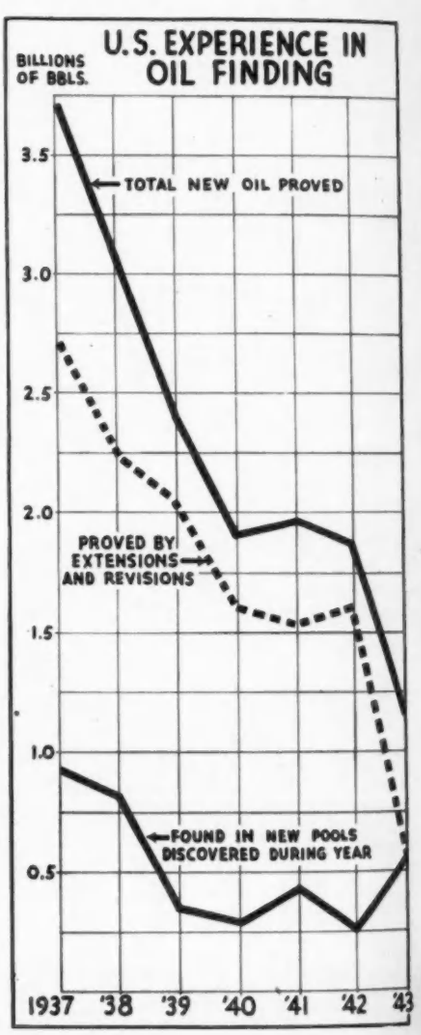
Most of the new oil was added through continued development and extension of fields found prior to 1943. Further development of these older fields resulted in a net addition of 616,225,000 barrels of crude oil. Development of new fields and new pay horizons discovered during the year added an additional 558,138,000 barrels of new oil. Many of these new fields had only a few wells at the close of the year, and estimates on the quantity of oil they will produce will be revised upwards as further development occurs in future years.

Most of the states failed to find as much oil as they produced. Even Texas, which accounted for almost half of all the oil found in the nation during the year, failed to discover as much new oil as it produced during the year. Some of the states showed sharp declines in reserves, notably California and Oklahoma, through failure to come near replacing the quantity of oil produced. Texas was the only state that had a substantially larger percentage of the nation's reserves at the end of 1943 than the percentage of the nation's production that it produced, and the majority of states were producing a larger share of the country's production than they were credited with percentage of reserves.

The most significant increase in crude reserves occurred in Wyoming, where discovery of several prolific new fields and new pay horizons resulted in the discovery of 108,800,000 barrels of oil, of which 93,800,000 barrels was in new fields and pays. Since the state only produced 33,413,000 barrels during the year, its reserve total climbed to 445,959,000 barrels. Even at this higher reserve figure, Wyoming was producing about the same percentage of the country's oil as its percentage of reserves.

Other Rocky Mountain States, which





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comprise PAW District 4, had only mediocre success, but Wyoming's performance was sufficient to bring material increase in the region's reserves. It is now credited with 573,856,000 barrels, or 2.9 percent of the national total.

The sharpest decline in crude reserves occurred in California, or District 5. This state produced a record total of 283,880,000 barrels, but was able to discover only 77,225,000 barrels of new oil. Consequently, its volume of remaining reserves dropped to slightly less than 3 billion barrels. The state still is the second largest oil reserve. It has 15.1 percent of the nation's oil reserves, and during 1943 produced 18.9 percent of the country's crude production.

Most of the new oil found was in the Southwestern, or PAW District 3, group of states, but despite the large volume of new oil discovered in the territory's large production exceeded the quantity found. This region found 717,210,000 barrels, or 61 percent of the national total of new oil, but this did not equal its production of 801,845,000 barrels. Reserves of the region are estimated to have totaled 13,921,638,000 barrels at the close of the year, or almost 100 million under the level of a year previous. The region, however, still accounted for 70.4 percent of the nation's reserves, and therefore will continue to be its chief producing center. In contrast with its large percentage of the country's reserves, District 3 produced but 53.4 percent of the 1943 production of the nation.

Texas was largely responsible for the dominant position of District 3 in the nation's reserve picture, although other states, notably Louisiana, also are large reserve centers. Texas accounted for almost half of all the oil found in the nation during 1943, being credited with 522,300,000 barrels. Despite its big volume of new oil found, the state's production was 70 million barrels greater, and reserves at the end of the year totaled 11,475,143,000 barrels. Texas has 58.1 percent of the nation's reserves, but produced only 39.5 percent of the country's oil.

The discovery rate of District 3, was swollen because Louisiana ranked next to Texas in quantity of new oil discovered. A total of 121,250,000 barrels of oil was found in this state, just slightly less than it produced. This state, with 7.3 percent of the reserves, produced 8.2 percent of the oil.

Arkansas found more oil than it produced, due largely to installation of a water drive in the Midway field, which is calculated to have practically doubled the amount of oil this pool will produce.

With Oklahoma continuing to find less oil than it produced, and with Kansas and Illinois failing to offset the amount they produced, District 2 showed another decrease in quantity of crude reserves. The eight-state region found only 257,608,000 barrels of oil in contrast with a production of 348,628,000 barrels. The whole district has but 10.4 percent of the country's reserves, but produced 23.3 percent of the 1943 production. Unless new discoveries of importance are made somewhere in this territory, it is due to show further declines in production.

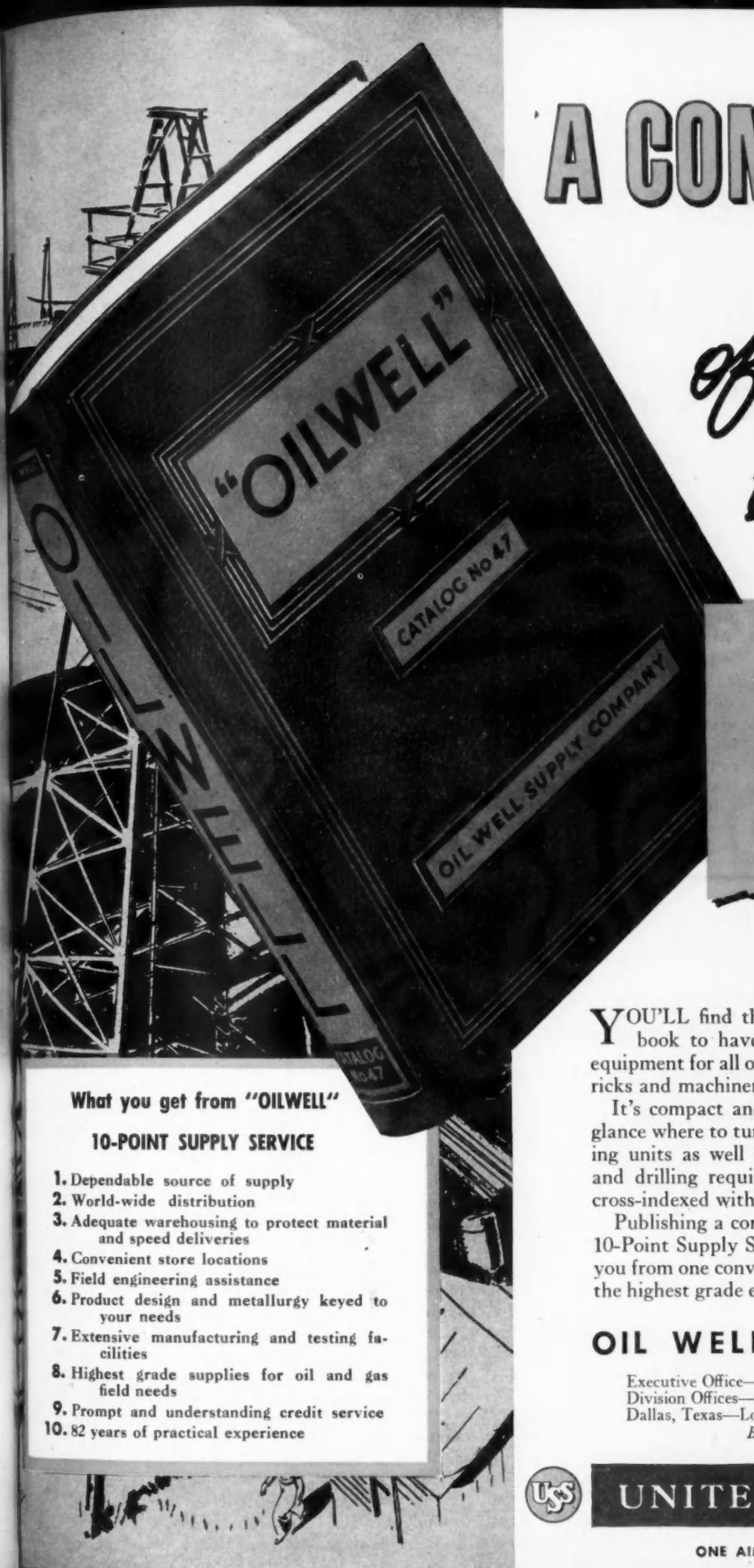
Chief contributor to the decline in District 2 was Oklahoma, which produced 122,740,000 barrels but found only 88,860,000 barrels. Kansas lacked almost 30 million barrels of finding as much oil as it produced, and Illinois was almost 15 million barrels short of replacing the amount of oil it produced.

Relationship of State Crude Reserve Volumes to Production Rates

	Percent of National Total	
	1943 Oil Production	Crude Reserves End of 1943
District 1:		
New York	0.3	0.3
Pennsylvania	1.1	0.7
West Virginia	2.2	0.2
	3.6	1.2
District 2:		
Illinois	5.5	1.5
Indiana	0.3	0.2
Kansas	7.1	3.3
Kentucky	0.5	0.2
Michigan	1.4	0.3
Ohio	0.2	0.2
Oklahoma	8.2	4.7
Nebraska	0.1	0.0
	23.3	10.4
District 3:		
Arkansas	1.8	1.6
Louisiana	8.2	7.3
Mississippi	1.3	0.1
New Mexico	2.6	3.3
Texas	39.5	58.1
	53.4	70.4
District 4:		
Colorado	0.2	0.2
Montana	0.5	0.4
Wyoming	2.2	2.3
	2.9	2.9
District 5:		
California	18.9	15.1

New Oil Volumes Found In 1943 And Resulting Reserves

	Reserves End of 1942	NEW OIL PROVED DURING 1943			Production During 1943	Proved Reserves End of 1943
		Through Extensions—Development	Through New Pools—Pays Discovered	Total		
District 1:						
New York	54,395,000	None	None	None	5,001,000	49,394,000
Pennsylvania	153,118,000	500,000	None	500,000	15,641,000	137,477,000
West Virginia	47,187,000	None	None	None	3,338,000	43,849,000
Total	254,700,000	500,000	None	500,000	23,980,000	231,220,000
District 2:						
Illinois	306,778,000	52,500,000	15,000,000	67,500,000	82,067,000	292,211,000
Indiana	31,773,000	2,750,000	1,000,000	3,750,000	5,249,000	30,274,000
Kansas	686,975,000	42,500,000	34,800,000	77,300,000	106,060,000	658,215,000
Kentucky	34,653,000	2,000,000	3,098,000	5,098,000	7,903,000	31,848,000
Michigan	63,843,000	7,000,000	8,100,000	15,100,000	20,663,000	58,280,000
Nebraska	2,177,000	None	None	None	669,000	1,508,000
Ohio	35,021,000	None	None	None	3,277,000	31,744,000
Oklahoma	968,927,000	36,500,000	52,360,000	88,860,000	122,740,000	935,047,000
Total	2,130,147,000	143,250,000	114,358,000	257,608,000	348,628,000	2,039,127,000
District 3:						
Arkansas	300,026,000	33,500,000	13,000,000	46,500,000	27,570,000	318,956,000
Louisiana	1,442,126,000	47,250,000	74,000,000	121,250,000	123,909,000	1,439,467,000
Mississippi	40,897,000	None	5,000,000	5,000,000	18,989,000	26,908,000
New Mexico	677,497,000	200,000	21,960,000	22,160,000	38,493,000	661,164,000
Texas	11,545,727,000	343,550,000	178,750,000	522,300,000	592,884,000	11,475,143,000
Total	14,006,273,000	424,500,000	292,710,000	717,210,000	801,845,000	13,921,638,000
District 4:						
Colorado	39,443,000	6,000,000	None	6,000,000	2,347,000	43,096,000
Montana	85,558,000	3,000,000	4,000,000	7,000,000	7,757,000	84,801,000
Wyoming	370,572,000	15,000,000	93,800,000	108,800,000	33,413,000	445,959,000
Total	495,573,000	24,000,000	97,800,000	121,800,000	43,517,000	573,856,000
District 5:						
California	3,195,846,000	23,975,000	53,250,000	77,225,000	283,880,000	2,989,191,000
Miscellaneous	254,000	None	20,000	20,000	53,000	221,000
Total United States	20,082,793,000	616,225,000	558,138,000	1,174,363,000	1,501,903,000	19,755,253,000



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Material Increase Forecast for 1944 New Well Drilling

THIS forecast of indicated new-well drilling in 1944 should be made twice. One figure shows 23,535; the other indicates 25,476 wells to be drilled during the year. THE OIL WEEKLY's estimate, made with the assistance of our field staff, and weighing all the factors which have been considered in making previous forecasts, indicate that the first figure will cover 1944 activity, as per the table accompanying. The second—and larger—figure is obtained by assembling reports from oil companies throughout the United States, including big, intermediate and small, a fair cross-section, to indicate that the companies furnishing us information on their own operations will drill 35.68 percent more wells than they drilled last year. Applying this yardstick to last year's total United States drilling this would mean 25,476 wells! Replies were received from companies which last year drilled 26.66 percent of all wells completed. (On one of the important areas information was received from companies which last year drilled 76.4 percent of the wells completed there.)

Number of completions expected to be up 25 percent and footage higher by 33 percent than 1943 totals, with exploratory drilling due to reach an all-time peak

The staff estimate on the number of wildcat wells to be drilled is paralleled fairly closely by the oil company indication.

In the past, estimates received from our district editors have invariably been somewhat higher than the company indications, and have been somewhat closer to the actual figure drilled. This year the company figures consistently top those of the staff summaries.

How Estimate Is Made

As has been the practice for many years in preparing for the forecast, we have addressed letters to oil companies representing what we believe to be a fair cross-section, asking them to give figures from their budgets as to the number of wells they plan to drill during the year, pumping equipment requirements, etc. This year an increased number of companies aided us under our pledge that the individual figures given us by the various oil companies would be kept confidential and used only in arriving at the various totals.

In addition, a number of state and conservation officials, as well as consulting geologists and engineers, have assisted by giving us the benefit of their individual judgments on various areas.

To all who have helped, our sincere thanks.

Finally, THE OIL WEEKLY's own editorial staff has made studies of the individual fields covered by its territorial editors, and in making the final estimates, all the information and opinions from all of the foregoing sources have been weighed and used.

Because an important discovery in one area may result in heavy removal of rigs from other territories, thereby changing the state or area operations but not substantially affecting the national total, it obviously is easier to forecast the national total than to estimate by state or state-sub-division total. That is why, although our forecast on several states went awry in 1943, our forecast for the nation as a whole was 99 percent accurate.

Foremost among the factors which point to increased drilling in 1944 is the need for more oil for winning the war. Despite plans to utilize more oil from the Caribbean area, demands for more domestic oil are increasing. It is even doubtful if the Caribbean area can reach, by the end of 1944, the goal set a few months ago of 1,135,000 barrels per day. In addition to the need for immediate oil, the need to replenish reserves is an important one. The United States has fallen far behind in its drilling during the past two years and some of this drilling must be made up immediately.

For the five years ending with 1941, the oil industry drilled enough wells to add approximately 11,000 producing wells each year. During the past year, only 2800 were added. Necessity of building up production is reflected in this and in the fact that the wells have been pulled heavier than at any time in history. Such a condition cannot go on indefinitely.

The government, through PAW, has asked for a record-breaking number of wildcat, or exploratory, wells. While the total of 5000 desired by PAW may not be attained, unquestionably this year will see the heaviest wildcat-drilling campaign in the history of the industry. Many of these wells will hit, and this in turn will affect drilling. However, all of the foregoing has been considered in our forecast.

Last year saw one new state, Florida, enter the producing column for the first time. It is possible that one or two additional states may become oil producing in 1944.

Drilling Forecast

The figures show that the upward trend covers all important producing areas except the Illinois-Indiana section, where relatively slight percentage drops are shown. The national gain of 25.28 percent over 1943 figures is topped by all but the Texas Panhandle, Texas as a whole indicating an increase of 56 percent over the drilling for 1943. Wildcatting, with an increase of 32 percent over 1943 figures, is up but 2 percent to an indicated 4692 exploratory tests for

STRENGTH

Note (in white circle) Bakelite nose begins to collapse. Note (at left) nose collapsed completely at 320,000 pounds.

BAKELITE GUIDES GIVE 30% MORE STRENGTH

The above picture shows method used to determine comparative strength of shoes equipped with Bakelite guides and shoes made with the older style concrete guide. The tests were conducted by oil company engineers.

The Bakelite nose of the guide shoe tested began to fracture at 250,000 pounds but did not give away completely until 320,000 pounds were applied.

Numerous shoes were tested and this was the average test. It indicated a strength 30% greater than concrete nosed shoes similarly tested.

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19.94 percent of the national totals. This apparent discrepancy in wildcatting is explained by the substantial increase forecast also for wells in proven areas.

It is significant that the percentage increase in wells is exceeded by that calculated for the footage to be drilled in 1944. The trend toward deeper drilling, aided by the lessening of exploration in the Illinois-Indiana area, brings the anticipated increase in footage drilled to 33.25 percent of 1943's totals. On a per-well basis, the increase shows to be 88 feet, or 3 percent greater depth than last year. The average depth per well for 1944 is indicated to be 3211 feet.

Foreign Operations

Present plans in Allied, or friendly countries during 1944 indicate that drilling will be approximately as follows: Trinidad, 120 wells; Venezuela, 580 wells; Colombia, 25 wells. Information on drilling plans for Mexico is not available at this moment, but Mexico desires to increase its falling production. Drilling in other Central or South American countries will be as great in 1944 as in 1943 if not greater. It is anticipated that Argentina's operations may see substantial increase if equipment can be had. In addition, Russia is maintaining a steady drilling campaign which is calling for considerable equipment. The Near East operations promise an increase. Canada is carrying on a substantial campaign. No figures on these countries have been developed for publication.

Rig Situation

On page 116 appears a table on rotary and cable tool rigs in operation by states. The total of rotary rigs drilling is shown at 1859, with 251 rotary rigs up, a total of 2110, not counting rigs shut down. A private source indicates only 1830 rotary rigs available for service, while a survey, just completed by the Material Division of PAW (and reported in this issue also) estimated rigs now operating at 1560. The PAW survey indicates that rotary rigs for which plans are being made to operate in the first quarter number 1720, while this number is expected to increase to 1790 by the fourth quarter.

A questionnaire sent by THE OIL WEEKLY to manufacturers of rotary drilling rigs and which was replied to by a large percentage of the manufacturers, suggests that these manufacturers are in a position to produce around 465 rotary rigs in 1944, and that with the proper help and breaks this figure could be boosted to in excess of 500. Around 200 of these rigs might be used for heavy-duty drilling.

Our check on the rig situation shows there will be a market for every rotary and cable-tool rig likely to be manufactured, with possibly a demand for considerably more.

Cable-Tool Requirements

No information is available on cable-tool requirements for the year, but it is apparent that much replacement material will have to be manufactured to take care of the number of cable tools the industry will have in service. THE OIL WEEKLY's survey as of January 1, 1944, showed 1039 cable-tool rigs either running or rigged up. There is a possibility that the number of cable-tool rigs may be somewhat in excess of this figure, which would mean that such number as is added to the above on cable tool rigs,

Indicated Wells and Footage to Be Drilled in 1944

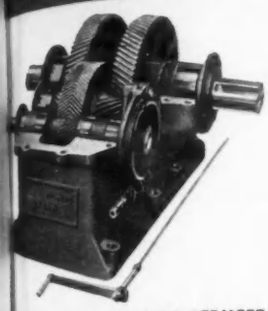
STATE OR DISTRICT	TOTAL WELLS				WILDCAT COMPLETIONS		FOOTAGE DRILLED*		
	Actual New Wells Completed, 1943	Old Wells Drilled Deeper, 1943	New Wells Forecast, 1944	Percent Change	Forecast, 1944	Percent of New Wells, 1944	Actual, 1943	Forecast, 1944	Percent Change
Alabama	2	....	8	+ 300	8	100	11,127	27,000	+143
Arizona	5	....	8	+ 60	8	100	14,498	24,000	+ 66
Arkansas	258	1	396	+ 53	100	25	1,213,047	1,800,000	+ 48
California	1,444	33	1,769	+ 23	265	15	4,609,932	7,024,000	+ 52
Colorado	34	....	45	+ 32	15	33	92,181	115,000	+ 25
Florida	5	....	14	+ 180	10	71	22,833	120,000	+426
Georgia	4	....	8	+ 100	8	100	13,660	27,000	+ 98
Illinois	1,773	39	1,550	— 13	418	27	4,515,871	3,911,000	— 13
Indiana	300	5	285	— 5	100	35	552,738	536,000	— 3
Iowa	3	....	2	— 33	2	100	4,874	5,000	+ 3
Kansas	1,714	34	2,357	+ 38	560	24	5,772,016	7,823,000	+ 36
Kentucky	425	2	597	+ 40	150	25	796,611	1,114,000	+ 40
Louisiana	667	....	912	+ 37	189	21	4,452,183	6,194,000	+ 39
North Louisiana	319	....	407	+ 28	99	24	1,328,620	1,674,000	+ 26
South Louisiana	348	....	505	+ 45	90	18	3,123,563	4,520,000	+ 45
Michigan	595	9	640	+ 8	264	41	1,549,702	1,641,000	+ 6
Mississippi	87	....	133	+ 53	81	61	474,217	631,000	+ 33
Missouri	9	....	40	+ 344	25	63	24,304	33,000	+ 36
Montana	242	....	409	+ 69	45	11	531,846	902,000	+ 70
Nebraska	39	....	44	+ 13	31	70	98,504	109,000	+ 11
New Mexico	258	13	420	+ 63	90	21	800,170	1,206,000	+ 51
New York	1,241	....	1,425	+ 15	50	4	1,713,195	1,966,000	+ 15
North Dakota	.....	.....	2	.....	2	100	.....	14,000	.....
Ohio	725	12	700	— 3	85	12	1,864,545	1,678,000	— 1
Oklahoma	1,358	108	1,587	+ 17	342	22	4,515,118	5,001,000	+ 10
Oregon	.....	.....	1	.....	1	100	.....	5,000	.....
Pennsylvania	2,519	10	2,650	+ 5	80	3	4,352,533	4,558,000	— 5
South Dakota	.....	....	3	.....	3	100	.....	20,000	.....
Tennessee	6	....	15	+ 150	11	73	6,134	15,000	+145
Texas	4,227	143	6,612	+ 56	1,638	25	18,176,176	28,892,000	+ 59
East Texas	227	1	380	+ 37	114	30	1,526,753	2,103,000	+ 38
North Texas	1,070	38	1,525	+ 43	368	24	2,945,070	4,188,000	+ 42
†South Texas	1,077	3	1,908	+ 77	569	34	5,576,392	10,508,000	+ 88
Lower Gulf Coast	639	2	1,199	+ 87	392	33	3,847,037	7,415,000	+ 93
Southwest Texas	371	1	614	+ 65	162	26	1,525,191	2,595,000	+ 70
South Central Texas	67	....	95	+ 42	15	16	204,164	398,000	+ 95
Upper Gulf Coast	336	1	596	+ 77	194	33	2,564,387	4,456,000	+ 74
Texas Panhandle	195	7	233	+ 19	15	6	604,996	752,000	+ 24
West Texas	903	68	1,460	+ 62	228	16	4,067,030	5,765,000	+ 42
West Central Texas	369	25	510	+ 38	150	29	891,548	1,220,000	+ 49
Utah	.....	....	1	.....	1	100	.....	5,000	.....
Virginia	.....	....	2	.....	2	100	.....	2,000	.....
Washington	.....	....	1	.....	1	100	.....	4,000	.....
West Virginia	699	18	727	+ 4	75	10	1,951,028	2,029,000	+ 4
Wyoming	126	....	172	+ 37	30	17	535,736	733,000	+ 37
Total United States	18,785	427	23,535	+‡25.28	4,692	19.94	58,664,779	78,164,000	+ 33.25

* Footage drilled in 1943 and footage forecast for 1944 include, respectively, footage of wells drilled deeper in 1943 and that footage expected to be added by drilling old wells deeper in 1944.

† South Texas totals included in Texas state totals.

Forecast covers all new wells to be drilled in 1944, including salt-water-disposal wells and water and gas-input wells for repressuring and secondary recovery. Based altogether on reports from oil companies which drilled more than 5,000 of the 18,785 new wells completed in 1943, as many as 24,476 wells may be drilled in the United States during 1944.

PACIFIC
OILFIELD
EQUIPMENT



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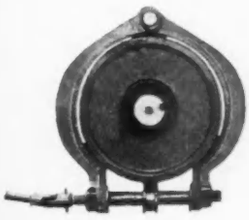
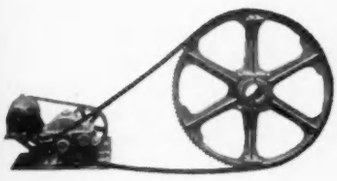
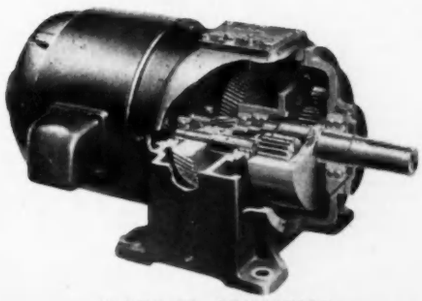


PACIFIC SAFETY BRAKE

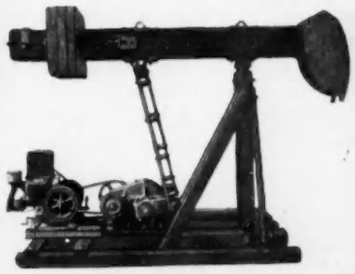
TYPE B
PUMPING UNIT



PACIFIC BANDWHEEL DRIVE



PACIFIC-GE. GEARMOTOR



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should be taken from the estimate of rotary rigs.

Regional Indications

The area included in PAW District 3 gives every evidence of becoming most active of all oil producing areas during the coming year. Transportation difficulties, which held back that area during 1943, have been removed or lessened by construction of pipe lines and revision of other carrying methods and pipe-line proration, effective in holding back production and inhibiting drilling is now evoked only momentarily in case of line damage. The area has also seen substantial additions to its refining capacity, and is in a position to utilize not only the expected increase to come from the augmented drilling program, but also to offer incentive for even greater activity in that area.

California, geographically nearest the most tenacious of the Axis partners, naturally is expected to go "all out" in an effort to discover and produce oil to keep up a constant flow of petroleum products to the Pacific Army and Navy forces, with summation of data indicating that the 1769 wells forecast for the state should (on basis of last year's percentages) afford that area more than 1300 new producers.

Likewise under specialized wartime demand, Pennsylvania, New York, West Virginia and Ohio will see drilling programs which will keep producing well totals from lagging as far behind as would be the case were the normal trend of abandonments to be followed. These states, under the urge of increased secondary-recovery methods, plan additional drilling to seek out the residual crude bypassed by earlier and not so efficient methods.

Geographical considerations, the desire to produce as much oil as possible close to refining and distribution centers, combine to add more than the usual pressure on development in areas which may not have the reserves of other or more favored sections, will see the transfer to and retention of rigs in those areas against indications that greater footage could be drilled were they moved to other sections of the country.

In some areas, such as Texas' Lower Gulf Coast, the figures presage an early drilling of large areas already proven, and whose development has been retarded by the twin shortages of equipment and transportation. The orderly development of these areas, covering a large proportion of the total footage indicated, in some cases bring the indicated probable producers percentage to as high as 95 percent of oil-seeking wells to be drilled in that area after deduction of the indicated wildcat figure.

Drilling of old wells deeper, either as producers into already known lower sands, or as what are all but "officially-designated" wildcats seeking pays below present depleted zones, while not entering into the figures presented in the compilation, are expected to increase materially both in number and on a percentage basis over 1943's showing, with such anticipated extra footage being carried into the estimated totals and there tending to reduce the average depth obtained by dividing total wells forecast against footage.

Any estimate made on operations of the oil industry in 1944 faces the dilemma of manpower and material shortage, plus the possibility that close of the war in Europe might lift regulations which have limited individual enterprise. In making the foregoing forecast, we have taken into consideration the plans of the oil companies throughout the United States, the disposition of governmental agencies to aid drilling and producing activities by making more materials available — and the anticipation, which may not be well founded, that manpower will be acquired to carry out the plans. Many things could easily interfere with the accuracy of the forecast, most of which things could come from governmental action, tax legislation, price increase, etc. However, the forecast is offered as one made without bias and on the best information obtainable.

PAW Survey Shows Much Rotary Drilling Material Needed

MORE than 1800 rotary rigs may be in operation in the United States by the end of this year, it is indicated by a survey of material needs of production operators just completed by Frank A. Watts, PAW director of materials.

This figure contrasts with a total of 2333 rigs which THE OIL WEEKLY staff derived from oil company drilling reports.

A report from a reliable private source, on the other hand, sets the figure at 1830 rotary rigs "in shape for operation."

The PAW operating figure is based on a questionnaire distributed among all known domestic operators using rotary rigs, of whom there are approximately 400, and on responses received covering 82 percent of the known rigs. The inquiry was marked by a much higher percentage of participation than is usually secured by questionnaires.

Want New Rigs

Results of the inquiry, which showed, among other things, plans of operators to add 144 new power rigs and three steam rigs and for the use of 5,626,700 feet of drill pipe during the year, checked closely with the estimates made in the past by the materials divisions, Watts said.

A summary of the returns showed that the reporting operators plan to have 1720 rotary rigs in use during the first quarter of this year, 1740 in the second quarter and 1790 in the last half. Their equipment needs will include 382 internal combusion engines, 29 steam engines, 120 boilers, 179 mud pumps and a large volume of miscellanous equipment, as shown in detail in the accompanying table.

SECTION I

*Number of rotary rigs owned or controlled and which are now operating	1,560
*Average number of owned or controlled rotary rigs for which plans are being made to operate during the first quarter of 1944	1,720
During the second quarter of 1944	1,740
During the second half of 1944	1,790

†SECTION II

Rotary rigs now on order, and rotary rigs for which plans are being made to order for delivery during the first half of 1944	112
For delivery during the second half of 1944	35

	First Half, 1944	Second Half, 1944
1a. Number of Power Rigs‡	109	35
1b. Number of Steam Rigs‡	3	.....
2a. Number of Internal Combustion Engines for Power Rigs	272	94
2b. Number of Steam Engines for Steam Rigs	6	.....
3a. Number of Mud Pumps for Power Rigs	140	42
3b. Number of Mud Pumps for Steam Rigs	9	.....
4b. Number of Boilers for Steam Rigs	20	.....

†SECTION III

Additional items of drilling machinery required for either: (a) Rotary Rigs now in operation which will require equipment additions or replacements; (b) idle Rotary Rigs for which plans are being made to operate during 1944; or (c) any other Rotary Rigs for which plans are being made to acquire and operate during 1944.

	First Half, 1944	Second Half, 1944
1. Number of Internal Combustion Engines	270	112
2. Number of Steam Engines	20	9
3. Number of Boilers	80	40
4. Number of Mud Pumps	120	59
5. Miscellaneous Drilling Equipment:		
Number of Crown Blocks	94	56
Number of Traveling Blocks	123	55
Number of Drill Collars	730	410
Number of Hooks and/or Connectors	126	63
Number of Rotary Machines (Tables)	145	81
Footage of Drill Pipe (with or without tool joints)	*3,900,700	*1,726,000
Number of Blowout Preventers	142	68
Number of Grief Stems (Kellys)	200	97
Number of Swivels	150	90

* Includes rigs which are owned or controlled but are drilling for other operators on a contract or lease basis.

† Section II includes complete rigs only. Section III covers items for other rigs. Equipment listed in Section II must not be included in Section III.

‡ Consists of Draw Works, Transmission, and Pump Drive.

SPEEDS UP WORK

SAVES MATERIAL

THE Petroleum Industry can well be proud of its war-time production record. Its high-operating efficiency—developed during peace—had much to do to bring the war to its "final phase".

In keeping with a well-established American principle, the oil producers of this country have long been quality-conscious about their production tools. This demand for greater efficiency through quality equipment is reflected in the wide-spread acceptance of "HERCULES" (Red-Strand) Wire Rope in the oil field.

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Wells to Go on Artificial Lift at Accelerated Pace

An estimated 13,058 wells will require lifting equipment this year, against 10,166 during 1943

DURING 1944 an estimated 13,058 wells will be put "on the pump"—using the customary oil-country designation for wells produced other than by natural flow—that is, wells which require mechanical equipment to produce their oil. This compares with a total of 10,166 wells which went on the pump during 1943. THE OIL WEEKLY's estimate for that period was 11,591, for which it was forecasted 6953 pumping units would have to be provided other than those already available through replacement, reclassification of units and abandonment of old wells. The corresponding forecast for 1944 is 10,459 "new" units of pumping equipment.

In 1943 the industry was asked to provide new equipment for 60 percent of the wells which would require artificial lift; for 1944 the figure rises to 81 percent. This apparently steep rise in demand reflects the absorption of pumping-equipment manufacturing facilities in war work during 1943, with resultant drain on existing stocks of units, and also approach of the end of the period when oil companies could meet a part of their pumping equipment demand by installing new units at wells showing augmented pumping load, at the same time switching the old unit to some well where at least temporarily it met lifting demands.

This shifting of units as pumping loads increase no longer fills the gap left by obsolescence or occasional wrecking of a unit, and this factor now joins with indicated increased completion rate of pumping wells to step up the demand some 1500 units over last year's figure, with the increase in new equipment augmented by 3500.

One of the factors indicating increased pumping demand is that new drilling will stress geographical location of crude instead of being influenced so much by production characteristics of the horizon being drilled as was the case in 1943. Another factor is the forcing of many fields beyond optimum producing conditions to meet urgent war demands.

Effect of salt-water reinjection in the East Texas field is shown in the slight drop in total number of pumping wells to be maintained during the year as compared with 1943. The favoring of fields known to produce naturally in last year's drilling campaign also aids in reducing the overall total of wells requiring artificial lift, the replacement of abandoned wells being cared for more by flowing production, with consequent lessening of maintenance totals.

Increased cost of replacement parts, with a forecast step up in major rehabilitation of many units in 1944, brings the overall expenditure for maintenance to $25,339,000 against $25,122,000 for 1943. The expenditures forecast for new equipment, made for the entire United States without attempt to break down by areas, indicate that an amount approaching the prospective maintenance figure will be required to provide the indispensible units—whether surface, sub-surface or gas-lift—which will be needed to keep many wells producing in 1944.

It appears that water-flooding, repressuring and other secondary-recovery methods, expected to cut into the demand for new pumping equipment, are not going to reduce the estimated pumping unit total over that factor as weighed in the 1943 estimated demands, with evidence tending to show that the effect of such secondary recovery aids will entail larger percentages of pumping aids in those areas where initial efforts resulted in re-establishment of flowing conditions. The principal assistance in the problem of providing pumping equipment will come, as last year, in the lightening of the load on individual units, thus permitting the transfer of relatively heavy equipment to sites where full use may be taken of the built-in capacity.

1944 Pumping Equipment Estimate

STATE OR DISTRICT	Number of Wells Likely to Go On Pump or Air/Gas Lift During 1944	Number Pumping Units, all Kinds, Including Gas-Lift Units Probably Needed During 1944 in Addition to Available Used Equipment	Estimated Average Number Pumping Wells to be Maintained During 1944	Number of Flowing Wells at Close of 1943	Estimated Maintenance Cost,* (Equipment Only for All Pumping Wells in 1944
Arkansas	195	105	2,704	2,607	$ 174,000
California	1,400	1,400	19,005	1,698	5,799,000
Colorado	14	10	150	19	12,000
Illinois	965	965	26,250	260	1,575,000
Indiana	101	73	1,800	....	90,000
Kansas†	1,247	1,247	25,950	410	1,946,000
Kentucky	285	235	14,339	9	358,000
Louisiana:					
North Louisiana	196	120	3,323	558	266,000
South Louisiana	230	130	1,000	1,953	80,000
Michigan	325	325	3,300	178	247,000
Mississippi	23	23	369	15	37,000
Montana	225	160	2,200	8	187,000
New Mexico	510	500	1,460	2,662	294,000
New York	900	900	22,640	....	340,000
Ohio	148	75	22,350	....	615,000
Oklahoma	655	262	50,538	425	4,043,000
Pennsylvania	1,193	1,000	85,000	....	1,199,000
Texas:‡					
East Texas**	750	400	11,060	17,456	1,465,000
North Texas	1,100	800	17,500	1,703	1,137,000
Upper Gulf Coast	606	506	3,150	5,181	315,000
Lower Gulf Coast	410	150	735	2,169	73,000
Southwest Texas	460	365	5,786	2,558	575,000
South Central Texas	10	....	3,075	81	184,000
Texas Panhandle	163	120	5,701	37	570,000
West Texas	725	495	6,770	7,882	2,437,000
West Central Texas	75	40	7,454	552	484,000
West Virginia	87	25	16,940	....	296,000
Wyoming	40	20	3,428	186	514,000
Others	20	8	270	....	27,000
Total	13,058	10,459	364,247	48,607	$25,339,000

* Cost of initial installation pumping equipment on new wells not included.
† Revised figures from last year on number pumping wells in Kansas.
‡ Data on number of Texas wells to be maintained based upon Texas pumping wells at close of November, 1943, plus one-half of estimated other wells to go on pump during year.
** Figures on number of wells to go on pump in East Texas field, included in general East Texas area data, are based upon maintenance of salt water drive in East Texas field. Failure to maintain drive would put large additional number of wells on pump.

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FULL HOLE

SIZE	Tool Joint Dia. O.D.	Tool Joint Dia. I.D.	Tool Joint Length Approx.	Diameter of Upset Drill Pipe: Diameter of Land	Diameter of Upset Drill Pipe: Inside Diameter
*2 7/8"	4"	1 7/8"	17"	3"	1 11/16"
3 1/2"	4 5/8"	‡2 1/16"	18"	3 5/8"	2 1/4"
4"	5 1/4"	2 11/16"	20"	4 1/8"	2 13/16"
4 1/2"	5 3/4"	†3"	20"	4 5/8"	3 1/16"
5 1/2"	7"	**3 11/16"	22"	5 1/8"	4"
6 5/8"	8"	5"	24"	6 3/4"	5"

Note: Acme Full Hole can be Furnished in Sizes: 3 1/2"–4 1/2" and 5 1/2".
* Reed Full Hole, Not A.P.I. Standard. † 2 11/16" or 3 1/2" Optional.
** 4" Optional. ‡ 1 7/8" Optional.

SEMI-INTERNAL FLUSH

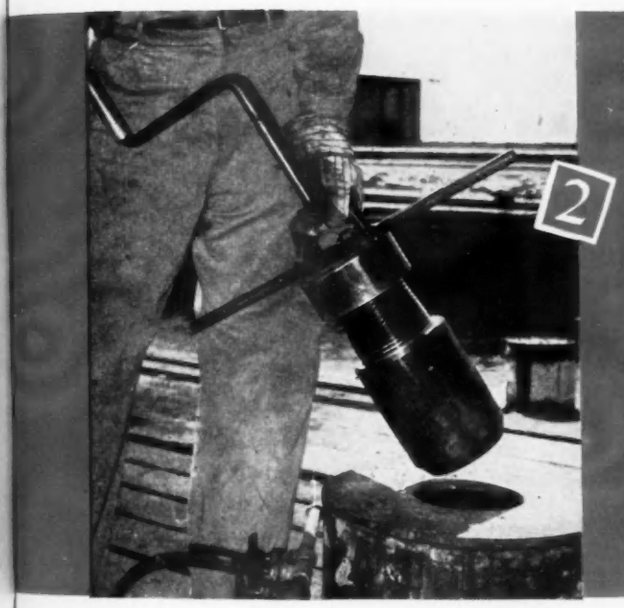
SIZE	Tool Joint Dia. O.D.	Tool Joint Dia. I.D.	Tool Joint Length Approx.	Diameter of Upset Drill Pipe: Diameter of Land	Diameter of Upset Drill Pipe: Inside Diameter
3 1/2"	4 7/8"	2 1/16"	18"	3 5/8"	2 1/4"
4 1/2"	6"	3 1/16"	20"	4 5/8"	3 1/2"

Note: The Tool Joint Box and Pin Connections have 4 A.P.I. Threads per Inch, with Larger Pin Diameter than A.P.I. Full Hole.

REED *Super Shrink-Grip* TOOL JOINTS FOR INTERNAL FLUSH DRILL PIPE

SIZE	Tool Joint Dia. O.D.	Tool Joint Dia. I.D.	Tool Joint Length Approx.	Diameter of Upset Drill Pipe
2 7/8"	4 1/16"	2 1/16"	17"	3 1/4"
3 1/2"	4 3/4"	2 11/16"	18"	3 7/8"
4"	5 3/4"	†3"	20"	4 5/8"
4 1/2"	6 1/4"	3 1/16"	20"	5 1/16"
5 1/2"	7 3/8"	4 1/16"	22"	6 1/16"
6 5/8"	8 1/2"	5 1/16"	24"	7 1/16"

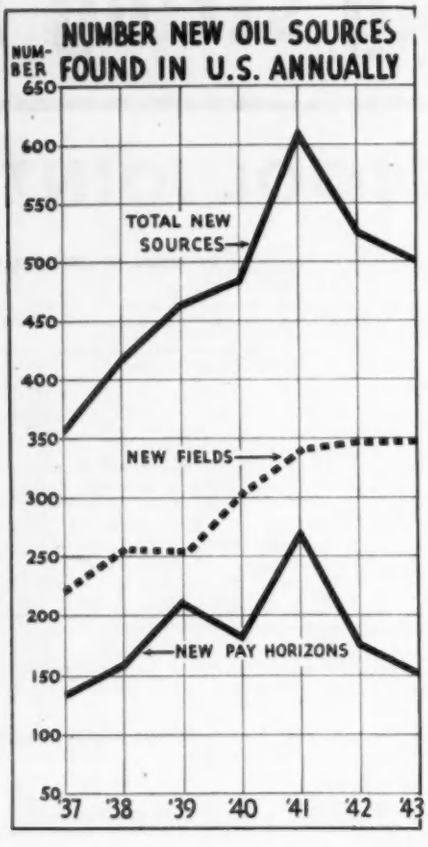
† 2 11/16" or 3 1/2" Optional.



The tool joint is heated to a temperature of 650° F. to 675° F. A lead stick is pressed lightly against the heated joint and when the lead starts to melt, the operator knows that the heat is at the proper temperature for application to the drill pipe. The heated tool joint is carried on the wrench to the end of the pipe, to which it is to be attached.

By means of the brace type wrench the heated tool joint is quickly screwed onto the drill pipe until the shoulder within the tool joint seats on the end of the drill pipe. Cooling causes the tool joint to shrink onto the drill pipe. Then the tool joint and drill pipe are ready for drilling service.

BIT COMPANY **HOUSTON, TEXAS**



Record Number of Wildcats But New Sources Drop Off

New fields and new pay horizons more in 1942 and 1941 than past year when 17.8 percent of 3599 wildcats drilled were successful; late strikes give promise of good development

THE petroleum industry drilled a record number of wildcat tests during 1943, despite wartime material and manpower shortages, but fewer new sources of supply (new fields and new pay horizons) were discovered than in 1942 and 1941. The peak number of wildcats completed during the year was the result of an exceptionally sharp increase in the latter part of the year, indicating that exploratory drilling in 1944 likely will exceed the high level achieved last year, a conclusion also borne out by THE OIL WEEKLY's survey of drilling plans for 1944 (page 84—this issue).

While the results of 1943 venture drilling did not satisfactorily fulfill the industry's requirements for supplying the greatest quantity of oil in history during coming years, it began to appear during the latter part of the year that more might have been achieved than at first believed. Several late in the year strikes had promise of developing into something important, and therefore the industry may have discovered more oil than currently indicated.

There were during the year a total of 3599 wildcats drilled, including field outpost attempts, and these resulted in the completion of 643 producing wells. Thus 17.8 percent of the wildcats drilled were successful in finding oil, gas or distillate.

Of the 643 productive wildcats, 348 opened new fields, 152 discovered new producing horizons in known fields, and the remaining 143 were extension wells.

The number of new fields found were exactly the same number as in 1942, and approximately the same as the 341 found in 1941. However, in view of the larger number of wildcats drilled, this was not exceptionally encouraging. Among the 348 new fields of 1943 were 275 oil fields, 55 gas fields, and 18 distillate fields. The 348 new fields found in 1942 had resulted in 288 oil fields, 47 gas fields, and 13 distillate pools.

The 152 new pay horizons discovered compared with the 175 new sources found in 1942. New pay horizons included 129 that yielded oil, 13 that produced gas, and 10 distillate producing wells, compared with 1942's record of 163 oil pays, 10 gas discoveries, and 2 new distillate pays.

The depths of 1943 discoveries were greater than that of 1942, the average depth of all discoveries the past year being 4592 feet compared with 4222 feet in the preceding year. The new fields were found at an average depth of 4620 feet, while the new producing horizons were found at an average depth of 4719 feet.

Two-Fifths of Discoveries Made in Texas

Of the 500 discoveries posted in the U. S. as a result of strict wildcat tests in 1943, exclusive of extension wells, 190 of them were made in Texas and of 643 productive wildcats of all types, 221 were credited to Texas. By categories—that state had 123 of the 348 new fields of the year; and 67 of the 152 new pay discoveries. Oddly enough, the average depth of the 221 exploratory producers was 5280 feet—exactly one mile.

The most significant discoveries were made in South Texas, which includes the lower Gulf Coast, Southwest Texas and South Central Texas. In that area, 36 new fields were discovered and 27 new pays were tapped. Most of these hits were localized along two trends: the Carrizo-Wilcox trend, through McMullen, Live Oak, Bee, Karnes and Dewitt counties; and the Frio-Vicksburg trend, in Brooks, Jim Wells, Kleberg and Nueces counties.

Of particular importance is the newly-opened Scott and Harper field, in Brooks County, where Humble Oil & Refining Company's discovery well logged 3 oil sands and 4 gas-distillate pays. This field is expected to be found productive over an area of more than 2000 acres, and promises to be prolific.

No field of major importance was opened during the year along the Upper Texas Gulf Coast, but important extensions and new pays were proved in old salt dome fields. Several thousand acres of production were added to the great Katy gas field in this manner, and the field's first commercial oil pay was found on the dome flank.

Large extensions were also made to the Stowell field, in Jefferson County, and the Old Ocean field, in Brazoria County. Gulf Oil Corporation proved several hundred acres productive on the east side of the Stowell structure, extending the field into Chambers County, and establishing it as a major reserve area.

Two Major Finds in East Texas

Two of the discoveries made in East Texas in 1943 are developing into major fields. Most important from the standpoint of large new crude reserves is the

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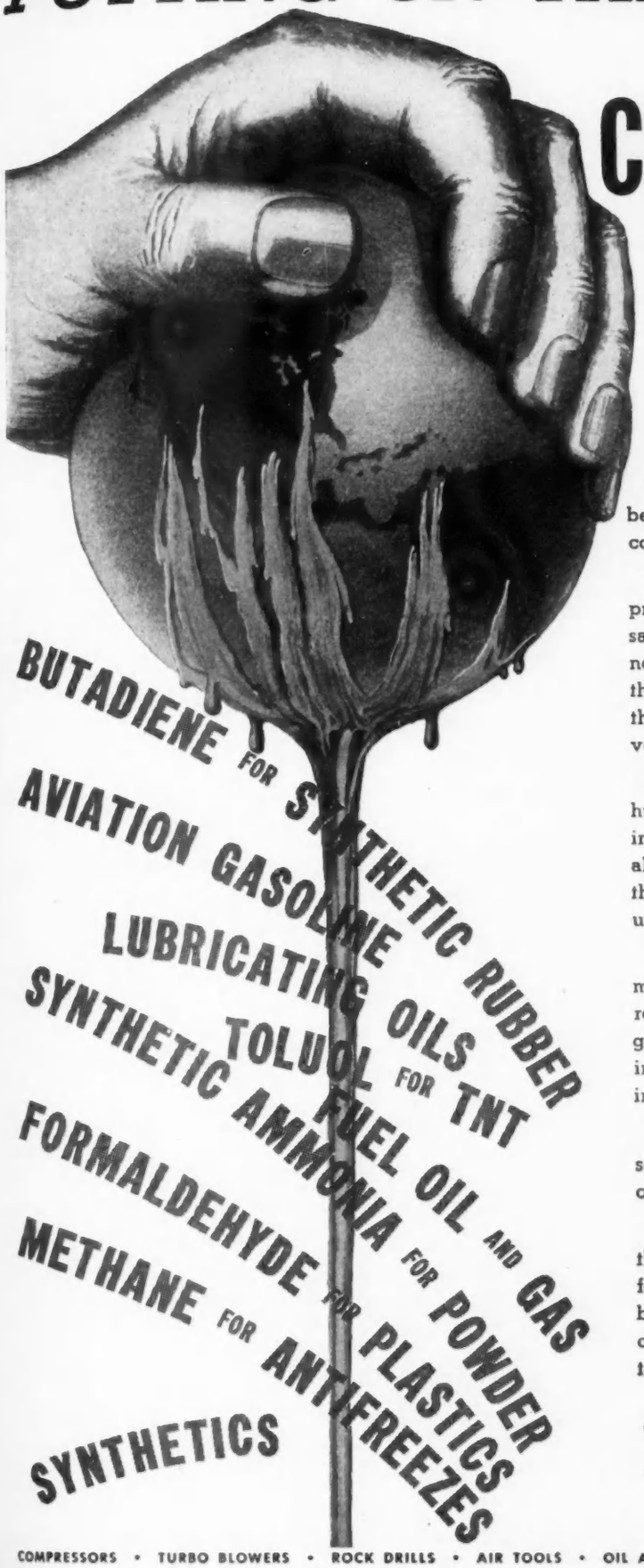

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Manziel field, in Wood County. This is the third discovery of Paluxy sand production in the county, and at the end of the year ten wells had proved 800 acres. It is being developed on a routine basis because of lack of pipeline connections at the present time.

The other large East Texas discovery was the New Hope field, in Franklin County, where dual completions from the Rodessa and Pettit sands apppear to be possible in most wells.

Not completed at the year's end was an assured new field discovery on the Sand Flat structure, in Smith County, 6 miles north of Tyler. Skelly Oil Company's wildcat had found pay zones in the Paluxy, Rodessa and Pettit series, but was proceeding to 10,000-foot depth with the contract hole.

Large Reserves Found in West Texas

The past year saw completion of three deep Ellenburger wildcat tests in Winkler County, the first holes drilled to that depth in the area. Although only partially developed by the year's end these strikes are conceded to be of major proportions. Two discoveries of perhaps equal importance were made in Andrews County; and the West Texas district registered altogether a total of 14 oil discoveries, 3 new gas fields, 4 new oil pays and 2 gas pays in 5 established fields. In addition, big extensions were proved in the Fullerton, Slaughter, Barnhart and Mascho fields—opening up many thousands of acres of almost certain producing territory.

List of new producing fields and pay horizons found during 1943, including discovery well, producing depth and other data, have been published in the third issue of each month during the past year.

The Ellenburger hits initiated considerable wildcat activity along the north-south trend west of the Pecos Uplift, but development was lagging, except for the routine proving of production around discovery wells.

Andrews County will see much new drilling as a result of the opening of the Union field, yielding sweet oil from the Clear Fork, and the Mabee field, which is producing from the San Andres. Drilling was at a fairly high level through most of 1943, due to follow-up development in the Embar, Mascho and Fullerton fields. Geological information indicates that the new Union field will embrace a large area. The Mabee field will apparently cover 3000 acres.

The Fullerton field was expanded in three directions, with no failures, adding more than 100 undrilled locations for future development. The oil here is equal in quality to the best in the Mid-Continent. Expansion of the Slaughter field to the north and west gave that area the greatest number of completions in the district, with many undrilled locations remaining. This is the largest producing structure in the Permian Basin. Further development will take place there after completion of the new 16-inch pipe-line outlet, scheduled in March.

North Texas Had Most Wildcat Strikes

North Texas had a better wildcatting record for 1943 than any other district in the state, with 45 oil discoveries in 11 counties, and 17 new oil pays found in 16 fields. In addition, 2 new gas pays were uncovered by deep tests.

New oil fields opened during the year show less promise than the new pays discovered in several localities. The proving of the Winger sand, of basal Strawn age, in the Walnut Bend field, Cooke County, was perhaps the most important. Before the end of the year 26 wells were producing from that sand in the field.

Finding of a good pay section in the Bend series made the Hildreth field, Montague County, one of the top producing areas of the district. Previous development of the field had been limited to Wilcox, following completion of the discovery well there in 1942, which well passed up the higher Bend saturation without a test. With 14 Bend wells and no dry holes since this second discovery the Hildreth field will be fully explored in 1944.

In Clay, Wilbarger and Young Counties deep production was found in the

Number of Discoveries (New Fields and New Pays) and Average Depths of the Discoveries in 1943, and Comparisons with Earlier Years

Data do not include productive outposts (extensions of established fields) as "Discoveries"

State or District	All Discoveries in 1943 (New Fields and New Pays)			DISCOVERIES AND AVERAGE DEPTHS IN 1943 COMPARED WITH THOSE IN EARLIER YEARS (New Fields and New Pays)																							
				New Fields Found						New Pays Found						Total Discoveries						Average Depth of All Discoveries*					
	Discovery Wells	Footage to Bottoms of Pays*	Average Depth*	1943	1942	1941	1940	9139	1938	1943	1942	1941	1940	1939	1938	1943	1942	1941	1940	1939	1938	1943	1942	1941	1940	1939	1938
Arkansas	6	34,808	5801	3	7	5	3	3	4	3			1			6	7	5	4	3	4	5801	6509	7528	5546	6879	6207
California	16	100,019	6251	13	4	10	1	4	8	3	2	5	1		5	16	6	15	2	4	13	6251	5635	5941	7252	8251	7489
Colorado	1	8,558	8558	1												1						8558					
Florida	1	11,625	11625	1												1						11625					
Illinois	74	187,203	2530	25	46	41	30	33	16	49	39	29	10	8		74	85	70	40	41	16	2530	2492	2640	2612	2500	2590
Indiana	3	6,221	2074	3	11	8	6	11	5		3	2	1	7	1	3	14	10	7	18	6	2074	2031	1696	1954	1763	1708
Kansas	55	193,843	3524	51	47	49	33	33	43	4	6	19	16	17	7	55	53	68	49	50	50	3524	3303	3360	3216	2943	3396
Kentucky	21	47,442	2259	20	4	3	3	4	3	1	2		1	4	1	21	6	3	4	8	4	2259	2311	1066	1512	1619	1588
Louisiana	32	302,600	9456	18	20	29	20	14	20	14	26	49	39	59	47	32	46	78	59	73	67	9456	7674	7809	6025	8019	7185
N. Louisiana	7	55,260	7894	5	9	12	4		1	2		4	1	1	3	7	9	16	5	1	4	7894	4120	4867	4083	8901	6969
S. Louisiana	25	247,340	9894	13	11	17	16	14	19	12	26	45	38	58	44	25	37	62	54	72	63	9894	8538	8569	7967	8080	7400
Michigan	27	68,811	2548	26	15	18	26	16	19	1	4	7	1	3	2	27	19	25	27	19	21	2548	2978	2466	2102	1772	2099
Mississippi	4	34,681	8670	4	1	2	1	1					1	1		4	1	2	2	2		8670	3679	4066	5617	4719	....
Missouri	3	2,267	756	3			1									3			1			756			400		....
Montana	5	8,521	1704	5	4											5	4					1704	1985				
Nebraska						1	1	1				2						3	1	1				2347	2453	2282	....
New Mexico	6	25,640	4273	6	8	5	8	5	7			1		1		6	8	6	8	6	7	4273	2715	2710	2214	3003	....
Oklahoma	50	226,243	4524	44	52	53	46	22	18	6	10	21	17	14	1	50	62	74	63	36	19	4524	3773	3360	3144	3891	4720
Texas	190	1,003,293	5280	123	124	117	125	107	113	67	79	132	92	97	94	190	203	249	217	204	207	5280	4854	4452	4649	4135	4303
Eastern Texas	2	12,720	6360		8	5	3	3	4	2	1	4	2		3	2	9	9	5	3	7	6360	5684	4781	5899	3260	5689
E. Tex. Border Co.					1												1						6010				
Rest of E. Texas	7	48,403	6915	5	7					2	1					7	8					6915	5616				
North Texas	64	285,808	4466	44	32	38	35	34	19	20	12	28	10	16	10	64	44	66	45	50	29	4466	4153	3516	3210	2824	3190
W. Central Texas	18	56,804	3156	13	19	13	14	15	17	5	11	11	3	3	5	18	23	24	17	18	22	3156	2384	2807	2399	2006	2746
West Texas	19	105,190	5536	14	16	14	18	9	12	5	8	7	2	3		19	24	21	20	12	12	5536	4797	4236	3666	3760	3823
Texas Panhandle					1			1	2								1			1	2		3226			2895	3126
Gulf Coast, Upper	15	130,078	8672	11	11	18	14	10	10	4	16	14	11	10	16	15	27	32	25	20	26	8672	7167	7060	7559	7281	6921
South Texas	63	377,010	5984	36	37	29	41	35	49	27	31	68	64	65	60	63	68	97	105	100	109	5984	5418	4652	5159	4622	4631
Gulf Coast Lower	40	269,463	6737	22	25					18	24					40	49					6737	5877				
Southwest Texas	23	107,547	4888	14	9					9	6					23	15					4888	4134				
South Cen. Tex.					3						1						4						4609				
Virginia					1												1						1113				
Wyoming	6	34,314	5719	2	4					4	4					6	8					5719	4518				
Total United States	500	2,296,089	4592	348	348	341	304	254	256	152	175	267	180	211	158	500	523	608	484	465	414	4592	4222	4352	3444	4253	4039

* Footage and average depths given separately for New Fields and New Pays, in 1942 and 1943, in other tables herewith.

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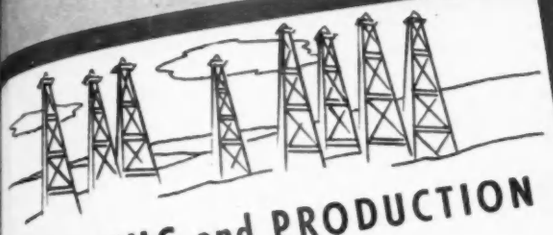

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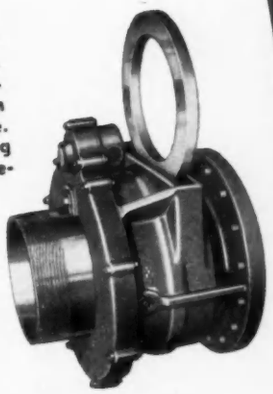

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Mississippian and Ellenberger limestones, with ultimate possibilities yet to be demonstrated. Jack County had further development of Bend and Strawn pays in small areas along the western rim of the Fort Worth Basin, encouraging more activity throughout the area.

In Wichita County, one of the most thoroughly drilled and developed counties in all of Texas, three new fields were added, with good production from the Strawn and Ellenburger series.

West Central And Panhandle Quiet

In the strippper well district of Texas (the west-central area) no discoveries were made that were sufficiently important to bring about a speed up of drilling activity. Crude reserves were boosted in Jones County by extensions of the producing area and dual completions in the Wimberly field, the leading one in the district at the present time.

Production increased in Stephens County as a result of the finding of 2 new pays in the Mississippi lime in several old shallow fields. The finds are of importance because of the good per-acre recoveries from Mississippi lime pays in the area, and the long flowing lives of wells drilled to them.

Routine field development wells accounted for nearly all the drilling done in the Texas Panhandle where neither new pay explorations nor outlying wildcats gave encouraging results. At the close of the year a well was drilling in the Borger sector of Hutchinson County, in an attempt to find pre-Permian production in producing territory.

Wyoming Predominant In Rocky Mountain

All Rocky Mountain states saw increased exploration activity in 1943, and, in Wyoming, results can be judged nothing short of spectacular. On the basis of discovery and preliminary development of production in the Big Horn and Powder River basins the state of Wyoming ranks high in outlining of new reserves during the year.

A half billion-barrel reserve is a conservative estimate of the ultimate yield from Elk Basin field at the north end of Big Horn Basin. The discovery well, and 21 others drilled during the year, have now proved up enough acreage in the field to assure the ultimate development of 4500 acres. There have been no dry holes in the field, and the average initial production of the 22 producers there was 2189 barrels per day, from the Tensleep formation (Permian). On January 1, 1944, there were 23 new drilling operations under way in the field, which extends across the border into Montana. Madison limestone possibilities remaind to be proved or thrown out.

At the southern end of Big Horn Basin a new pool of major rank was opened in December on the Gebo Dome, Hot Springs County, Wyoming, and conceded a single-well reserve of 4,000,000 barrels, on the basis of a 4320-barrel initial flow through choke, and a 107-foot pay zone in the Embar (Permian).

The Madison was not tested, but may be soon, although one company holds all the acreage within the probable limits of the field.

The Madison lime was proved as a big pay zone in the Frannie field, Park County, Wyoming — at least in that part of the structure lying north of the fault that cuts through the crest of the anticline. Considering the probability of a least 480 acres of Madison production, this find adds close to 5,000,000 barrels to Wyoming reserves.

Another 40,000,000 barrels of reserves are involved in the tapping of the Madison pay zone in the Oregon Basin field, 18 miles southwest of Cody. This field has two closures, with an unexplored saddle between, and the structure is approximately 11 by 6 miles in size. It produces from the Embar and Tensleep.

California Goes in the Red

Although drilling operations reached a new high in California in 1943, the emphasis was on the development of proved acreage and its extension rather than on the search for new fields. Wildcatting programs were only incidental in the all-out campaign to put down wells in those areas where production was virtually guaranteed in advance, even though nothing more than pumping wells, yielding low-gravity oil, were the objectives. The results were mediocre, as could be expected, in spite of

Total Footage and Average Total Depths Drilled in Wildcat Tests of 1943

STATE OR DISTRICT	Total Productive Wildcats (Including Discovery Wells of New Fields New Pays and Extension Areas)			UNPRODUCTIVE EXPLORATORY TESTS									TOTAL ALL WILDCATS (Productive and Unproductive)		
				Wildcats			Outpost Tests			Total Unproductive (Wildcats and Outposts)					
	Wells	Footage	Average Depth	Wells	Footage	Average Depth	Wells	Footage	Average Depth	Wells	Footage	Average Depth	Wells	Footage	Average Depth
Alabama				2	11,127	5564				2	11,127	5564	2	11,127	5564
Arizona				5	14,498	2900				5	14,498	2900	5	14,498	2900
Arkansas	11	58,233	5294	60	275,757	4596				60	275,757	4596	71	333,990	4704
California	23	143,128	6223	157	654,219	4167				157	654,219	4167	180	797,347	4430
Colorado	1	8,558	8558	9	29,491	3277				9	29,491	3277	10	38,049	3805
Florida	1	11,625	11625	4	11,217	2804				4	11,217	2804	5	22,842	4569
Georgia				4	13,660	3415				4	13,660	3415		13,660	3415
Illinois	139	375,160	2699	378	926,240	2450				378	926,240	2450	517	1,301,400	2517
Indiana	8	15,033	1879	84	153,109	1823				84	153,109	1823	92	168,142	1828
Iowa				3	4,874	1625				3	4,874	1625	3	4,874	1625
Kansas	59	206,566	3501	403	1,418,176	3519	5	17,846	3569	408	1,436,022	3519	467	1,642,588	3517
Kentucky	21	47,442	2259	118	235,690	1997				118	235,690	1997	139	283,132	3037
Louisiana	40	378,511	9463	112	619,898	5535	1	10,383	10383	113	630,281	5577	153	1,908,792	6593
North Louisiana	11	76,665	6970	94	459,190	4885				94	459,190	4885	105	535,855	5132
South Louisiana	29	301,846	10408	18	160,708	8928	1	10,383	10383	19	171,091	9005	48	472,937	9853
Michigan	29	73,155	2523	196	513,336	2619	8	27,856	3482	204	541,192	2653	233	614,347	2637
Mississippi	4	34,681	8670	51	293,987	5764				51	293,987	5764	55	328,668	6054
Missouri	4	3,658	915	18	15,425	857				18	15,425	857	22	19,083	867
Montana	6	12,421	2070	20	49,605	2480				20	49,605	2480	26	62,026	2386
Nebraska				31	79,070	2548				31	79,070	2548	31	79,070	2551
New Mexico	7	27,530	3933	48	128,635	2680				48	128,635	2680	55	156,165	2839
Oklahoma	57	257,584	4519	263	1,038,204	3948	1	4,314	4314	264	1,042,518	3949	321	1,300,102	4050
Tennessee				1	1,189	1189				1	1,189	1189	1	1,189	1189
Texas	221	1,220,131	5521	945	4,120,572	4360	21	100,906	4805	966	4,221,478	4370	1187	5,441,609	4584
East Texas Border Counties	4	25,096	6274	5	34,418	6883				5	34,418	6883	9	59,514	6613
Rest of East Texas	8	52,451	6556	88	450,959	5125	1	5,090	5090	89	456,049	5124	97	508,500	5242
North Texas	64	285,782	4465	230	644,368	2802	3	15,549	5183	233	659,917	2832	297	945,699	3184
West Central Texas	18	56,804	3156	115	276,456	2404	2	4,089	2045	117	280,545	2398	135	337,349	2499
West Texas	21	111,812	5324	79	378,767	4795	1	4,862	4862	80	383,629	4795	101	495,441	4905
Texas Panhandle				4	22,664	5666				4	22,664	5666	4	22,664	5666
Gulf Coast, Upper	26	202,867	7803	96	728,604	7590	1	±7,500	7500	97	736,104	7589	123	938,971	7634
Gulf Coast, Lower	53	359,086	6775	150	930,735	6205	7	40,670	5810	157	971,405	6187	210	1,330,491	6336
Southwest Texas	26	118,587	4561	124	499,500	4028	6	23,146	3858	130	522,646	4020	156	641,233	4110
South Central Texas	1	7,646	7646	54	154,101	2854				54	154,101	2854	55	161,747	2941
Wyoming	12	64,685	5390	8	26,321	3290				8	26,321		20	91,006	
Total United States	643	2,938,101	4569	2920	10,634,300	3642	36	161,305	4481	2956	10,795,605	3652	3599	13,733,706	3816

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Depths of Pays in *New Fields* Found in 1943

STATE OR DISTRICT	OIL			GAS			DISTILLATE			TOTAL NEW FIELDS 1943			TOTAL NEW FIELDS 1942		
	Discovery Wells	Footage to Bottoms of Pays	Average Depth	Discovery Wells	Footage to Bottoms of Pays	Average Depth	Discovery Wells	Footage to Bottoms of Pays	Average Depth	Discovery Wells	Footage to Bottoms of Pays	Average Depth	Discovery Wells	Footage to Bottoms of Pays	Average Depth
Arkansas	2	11,680	5840	....	.....	....	1	8,900	8900	3	20,580	6860	7	45,560	3175
California	7	44,724	6389	5	31,660	6332	1	11,600	11600	13	87,984	6768	4	24,122	6031
Colorado	....	.....	....	1	8,558	8558	....	.....	....	1	8,558	8558	....	.....	....
Florida	1	11,625	11625	....	.....	....	....	.....	....	1	11,625	11625	....	.....	....
Illinois	25	72,920	2917	....	.....	....	....	.....	....	25	72,920	2917	46	111,524	2424
Indiana	3	6,221	2074	....	.....	....	....	.....	....	3	6,221	2074	11	23,018	2092
Kansas	50	178,871	3577	1	805	805	....	.....	....	51	179,676	3523	47	153,962	3276
Kentucky	19	43,924	2312	1	790	790	....	.....	....	20	44,714	2236	4	8,940	2235
Louisiana	11	106,073	9643	3	22,874	7625	4	43,766	10942	18	172,713	9039	20	133,003	6650
North Louisiana	2	14,698	7349	2	13,724	6862	1	11,103	11103	5	39,525	7905	9	37,077	4190
South Louisiana	9	91,375	10153	1	9,150	9150	3	32,663	10888	13	133,188	10245	11	95,926	8721
Michigan	17	52,456	3086	9	12,380	1376	....	.....	....	26	64,836	2494	15	39,292	2619
Mississippi	4	34,681	8670	....	.....	....	....	.....	....	4	34,681	8670	1	3,679	3679
Missouri	1	1,450	1450	2	817	409	....	.....	....	3	2,267	756	....	.....	....
Montana	3	5,215	1738	2	3,306	1653	....	.....	....	5	8,521	1704	4	7,941	1985
New Mexico	5	18,721	3744	1	6,919	6919	....	.....	....	6	25,640	4273	8	21,717	2715
Oklahoma	29	133,877	4616	15	59,930	3995	....	.....	....	44	193,807	4405	52	192,326	3699
Texas	96	492,364	5129	15	67,928	4528	12	92,227	7686	123	652,519	5305	124	563,410	4544
East Texas Total	....	.....	....	....	.....	....	....	.....	....	....	.....	....	8	45,386	5673
East Texas Border Counties	....	.....	....	....	.....	....	....	.....	....	....	.....	....	1	6,010	6010
Rest of East Texas	4	26,388	6597	1	9,295	9295	....	.....	....	5	35,683	7137	7	39,376	5625
North Texas	43	185,230	4308	1	6,073	6073	....	.....	....	44	191,303	4348	32	132,580	1018
West Central Texas	7	22,065	3152	4	11,282	2820	2	5,232	2616	13	38,579	2968	19	37,788	1989
West Texas	13	74,731	5749	1	2,567	2567	....	.....	....	14	77,298	6236	16	76,802	4800
Texas Panhandle	....	.....	....	....	.....	....	....	.....	....	....	.....	....	1	3,226	3226
Gulf Coast, Upper	7	62,043	8863	1	4,600	4600	3	31,874	10625	11	98,517	8956	11	79,229	7203
South Texas Total	22	121,907	5541	7	34,111	4873	7	55,121	7874	36	211,139	5892	37	188,399	5092
Gulf Coast, Lower	11	74,720	6793	4	22,886	5722	7	55,121	7874	22	152,727	6942	25	135,678	5427
Southwest Texas	11	47,187	4289	3	11,225	3742	....	.....	....	14	58,412	4172	9	36,173	4019
South Central Texas	....	.....	....	....	.....	....	....	.....	....	....	.....	....	3	16,548	5516
Virginia	....	.....	....	....	.....	....	....	.....	....	....	.....	....	1	1,113	1113
Wyoming	2	10,428	5214	....	.....	....	....	.....	....	2	10,428	5214	4	14,276	3569
Total United States	275	1,225,230	4455	55	215,967	3927	18	156,493	8694	348	1,597,690	4620	348	1,343,883	3862

better prices for the heavy oil, offered to stimulate production.

Altogether, California new field discoveries for the entire year may be estimated safely to have added approximately 24,000,000 barrels to the state's reserves. Semi-wildcat extensions and new pays added perhaps 37,500,000 barrels in addition; and with a generous credit of 15,500,000 barrels for reserves added by wells in previously existing fields—the total adds up to no more than 77,000,000 barrels. Total production in the state in 1943 amounted to an estimated 283,000,000 barrels, making a net loss in reserves of more than 200,000,000 barrels.

Indiana-Kentucky

The most promising discovery in Indiana was made on the last day of the year, opening the South New Harmony pool in Posey County, producing from the McClosky Lime. Five new pools and two extensions, in four separate counties, comprised all Indiana discoveries during the year. From the character of these finds they can be credited with the outlining of perhaps 1,000,000 barrels of new reserves. A total of 82 wildcats were drilled in the state in 1942.

Kentucky had the best discovery year in its history as an oil-producing state. Drilling was up 157 percent over 1942, and wildcat ventures tripled in number. Out of this spurt in activity 19 strikes were registered. Most important was the opening of the Hitesville pool, in Union County, where the McClosky Lime, the Waltersburg and Cypress sands are all good yielders, and the Aux Vases sand promises to be proved for production in some parts of the pool. McClosky production was also tapped in the St. Vincent pool, 1½ miles southwest of Hitesville, suggesting that Union County will be the locale for impressive pool development drilling in coming months. The state's reserves were boosted 5,098,000 barrels

Depths of Pays in *New Producing Horizons* Found in 1943

STATE OR DISTRICT	OIL			GAS			DISTILLATE			TOTAL NEW PAYS 1943			TOTAL NEW PAYS 1942		
	Discovery Wells	Footage to Bottoms of Pays	Average Depth	Discovery Wells	Footage to Bottoms of Pays	Average Depth	Discovery Wells	Footage to Bottoms of Pays	Average Depth	Discovery Wells	Footage to Bottoms of Pays	Average Depth	Discovery Wells	Footage to Bottoms of Pays	Average Depth
Arkansas	3	14,228	4742	....	.....	....	....	.....	....	3	14,228	4742	....	.....	....
California	3	12,035	4011	....	.....	....	....	.....	....	3	12,035	4011	2	9,687	4843
Illinois	49	114,283	2332	....	.....	....	....	.....	....	49	114,283	2332	39	100,309	2572
Indiana	....	.....	....	....	.....	....	....	.....	....	....	.....	....	3	5,422	1807
Kansas	4	14,167	3541	....	.....	....	....	.....	....	4	14,167	3541	6	21,101	3517
Kentucky	1	2,728	2728	....	.....	....	....	.....	....	1	2,728	2728	2	4,926	2463
Louisiana	7	68,560	9794	2	18,933	9467	5	42,394	8479	14	129,887	9277	26	219,986	8461
North Louisiana	1	6,015	6015	....	.....	....	1	9,720	9720	2	15,735	7867	....	.....	....
South Louisiana	6	62,545	10424	2	18,933	9467	4	32,674	8169	12	114,152	9512	26	219,986	8461
Michigan	1	3,975	3975	....	.....	....	....	.....	....	1	3,975	3975	4	17,292	4323
Oklahoma	6	32,436	5406	....	.....	....	....	.....	....	6	32,436	5406	10	41,573	4157
Texas	51	247,415	4851	11	56,819	5165	5	46,540	9308	67	350,774	5235	79	422,047	5342
East Texas Total	2	12,720	6360	....	.....	....	....	.....	....	2	12,720	6360	1	5,550	5550
Rest of East Texas	2	12,720	6310	....	.....	....	....	.....	....	2	12,720	6310	1	5,550	5550
North Texas	18	85,245	4735	2	9,260	4630	....	.....	....	20	94,505	4725	12	50,134	4178
West Texas	4	24,770	8192	1	3,122	3122	....	.....	....	5	27,892	5578	8	38,336	4792
West Central Texas	4	13,853	3483	1	4,372	4372	....	.....	....	5	18,225	3645	11	33,725	3066
Gulf Coast, Upper	2	9,844	4922	....	.....	....	2	21,717	10859	4	31,561	7890	16	114,284	7143
South Texas Total	17	100,983	5940	7	40,065	5723	3	24,823	8274	27	165,871	6143	31	180,018	5807
Gulf Coast, Lower	9	55,838	6204	6	36,075	6013	3	24,823	8274	18	116,736	6485	24	152,294	6346
Southwest Texas	8	45,145	5643	1	3,990	3990	....	.....	....	9	49,135	5459	6	25,838	4306
South Central Texas	....	.....	....	....	.....	....	....	.....	....	....	.....	....	1	1,886	1886
Wyoming	4	23,886	5972	....	.....	....	....	.....	....	4	23,886	5972	4	21,868	5467
Total United States	129	533,713	4270	13	75,752	5827	10	88,934	8893	152	698,399	4719	175	864,211	4938

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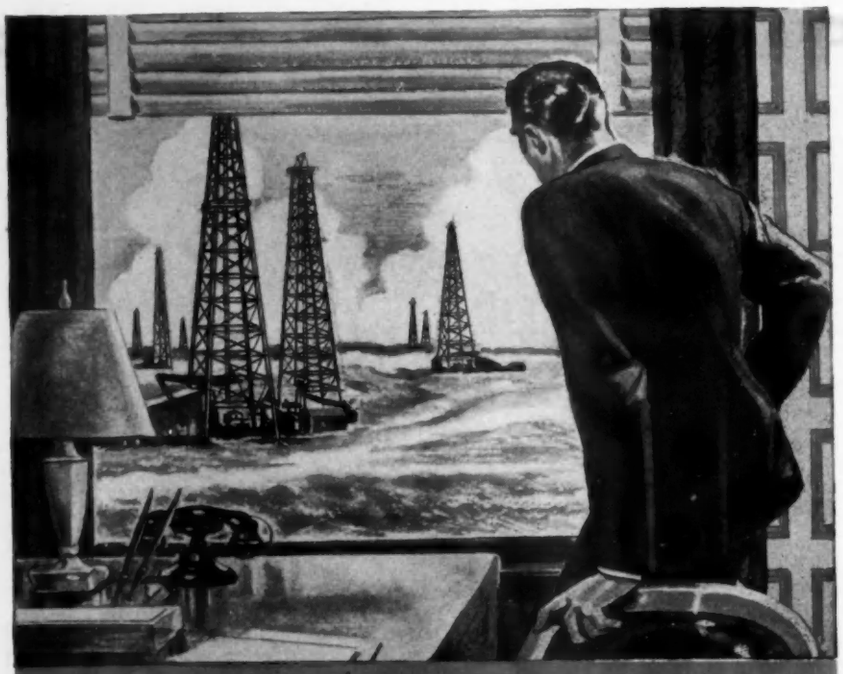
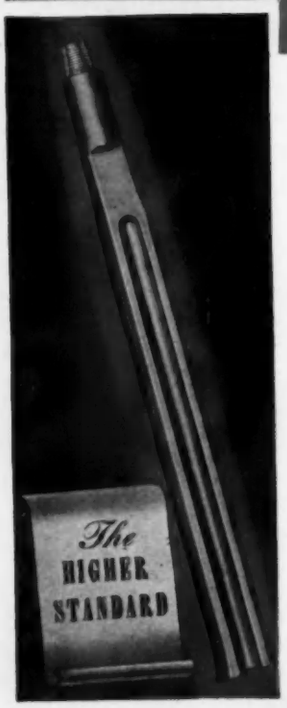


CONSERVATION
is necessary



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by 1943 discoveries, according to the computations of State Geologist D. J. Jones. This figure seems conservative, in view of the promise of more extensive developments under way in Union County, especially. The drilling up of the Smith-Mills pool should also contribute to upward revision of the reserve figure.

No Major Illinois Fields

No major fields were found in Illinois in 1943, although the new Maple Grove producing area approaches major rating, and more than the single McClosky pay should be proved there before long. Illinois' 1943 production was essentially balanced by new reserves found—largely due to the state's excellent 1943 record of new pay discoveries and extensions. New pool, new pay and extension discoveries for the year totaled 80, the most significant being in the Mt. Carmel, Dale-Hoodville, Iola and Albion pool areas. The further development of new pay and extension acreages in these four pools may pull any one or all of them up to major rank. *All four now have four pays under development.* The recent Tar Springs discovery in the Dale-Hoodville pool made an 1100-barrel well, flowing. Many more good Tar Springs wells can be counted on in the Hamilton County area, and the big extension to the Albion pool will be worth watching, from the standpoint of further proving of Illinois reserves.

No Outstanding Michigan Strike

While more wildcatting was carried out in Michigan in 1943 than in 1942, no outstanding discoveries were made. Drilling activity was most intensive in the northern and eastern parts of the state, following earlier discoveries of Detroit River and Richfield lime production at moderate depths. Numerous well failures, small wells and high drilling costs combined to deflate the boom that seemed to be under way early in the year. Two new fields were opened for Traverse production, at Rose Lake, in Osceola County, and at Goodwell, in Newaygo County, but not much is expected from them, inasmuch as the Traverse is only occasionally a prolific producer and is never uniform as to thickness or porosity from well to well.

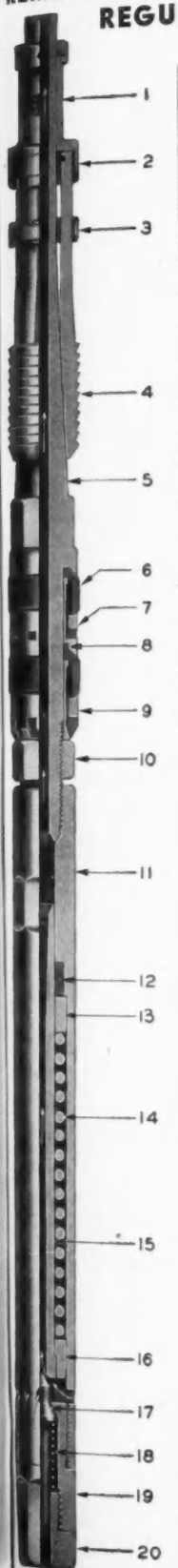
Information Gained in Nebraska

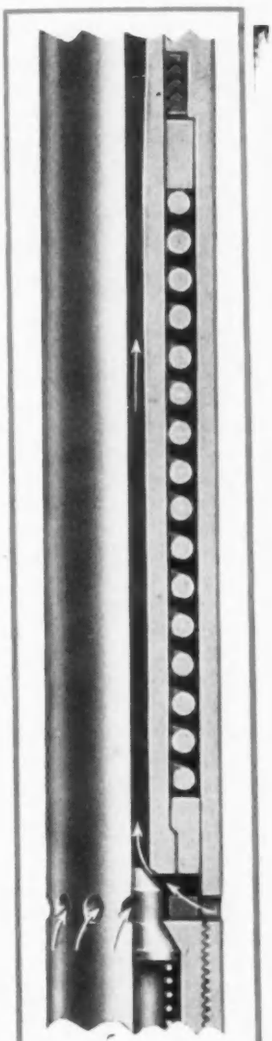
Thirty-one attempts to find production in Nebraska during the year resulted in the addition of valuable geological information, but no oil wells. Several shows give hope for the outcome of further drilling ventures, if local structures can be isolated for testing. Several more wells were put down in the Forest City Basin area, without adding to the output from either the Hunton or Viola limestones. The best

Sub-Surface Facts
ON THE CONTROL OF FLOWING WELLS

No. 4 | 1944 | DALLAS, TEXAS

REMOVABLE BOTTOM HOLE REGULATOR





Section Showing Adjusting Ring and Regulating Spring

PARTS LIST

1. *Slip Carrier*
2. *Slip Carrier Band*
3. *Mandrel Band*
4. *Slips*
5. *Mandrel*
6. *Otis Sealing Cup*
7. *Upper Sealing Cup Ring*
8. *Cup Ring Packing*
9. *Lower Sealing Cup Ring*
10. *Cup Nut*
11. *Valve Cage*
12. *Chevron Packing*
13. *Adjusting Ring*
14. *Regulating Spring*
15. *Valve Seat*
16. *Valve Seat Guide*
17. *Valve*
18. *Valve Spring*
19. *Valve Housing*
20. *Valve Housing Plug*

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The Bottom Hole Regulator simply adds the **surface-controlled rate of production** to the advantages of **bottom hole choking.** The opening through the regulator **automatically** changes when the size of the surface choke is varied to allow for increase or decrease in rate of flow. The regulator is, in effect, simply a pressure operated variable bottom hole choke.

Tubing flowing pressures are at all times reduced by a predetermined amount, placing them within a **safe workable limit.**

As indicated in the illustration, a movable valve seat is urged against a valve by a heavy coiled expanding spring. Well pressure acting against the area of the movable valve seat raises it to permit flow up through the orifice in the valve seat. As a result, the flowing pressure above the valve seat is always less than the pressure beneath it by the amount of effective compression per square inch introduced into the spring. The compression placed in the spring is controlled by the thickness of the regulating washer used.

The amount of possible variation in rate of production through the regulator is that amount which the well, after having its flowing pressure so reduced, is capable of producing against line or separator pressure. This possible range in rate of production, after flowing pressures have been reduced to a safe, non-freezing point, is in some instances as high as 9,000,000 cubic feet per day.

TUBING ACTS AS A "MILE LONG HEATER"

The taking of the principal pressure drop through an Otis Removable Bottom Hole Regulator set at several thousand feet below the surface, allows natural formation heat to absorb all resulting temperature losses. The tubing string becomes a "mile long" heater—the most practical and reliable known. This "mile long" heater, unlike surface heaters, does not require constant attention and adjustment.

To withstand the abrasive action of flow through the regulator, heat-treated K-Monel valves and seats with Kennametal inserts are used. This combination of metals has been found to be the most resistant to flow-cutting of all metals tried to date, and has proved very satisfactory, even in high velocity wells that produce sand. Other parts of the regulator are made of regular Monel and stainless steel, to eliminate the corrosive action of sour crudes.

REGULATOR CAN BE RUN OR PULLED ON AN ORDINARY STEEL MEASURING LINE...

The Otis Bottom Hole Regulator is run or pulled under pressure on an ordinary steel measuring line without disturbing the tubing or well pressure. Otis service crews, trained and skilled in the installation of all Otis sub-surface tools, are available in most high pressure areas.

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chance for new fields in the state seems to be confined to the south-central counties, where Pennsylvanian strata were found to carry shows of oil in strata of good porosity, permeability and distribution.

Wildcatting Increased 28% in Kansas

Kansas operators drilled 470 wildcat tests in 1943, compared with 367 in 1942, and 275 in 1941—adding an estimated 44,800,000 barrels of oil to the state's reserves, in new fields and new pays, exclusive of field development wells. Nearly one-third of the new reserves are credited to the Carmi field alone.

Exploratory drilling in every geologically-favorable area in the state accomplished the delineation of two definite producing trends. One is the projection of anticlinal production northwestward from the Central Kansas uplift into the Dodge City basin. The second extends north from the Lindsborg field into Saline County and into the southeast portion of the Salina basin. Further discoveries along these trends are expected in 1944, the north central and western parts of the state offering greatest future promise.

Oklahoma Holds The Line

Wildcatting in Oklahoma in 1943 was normal in volume, and rather encouraging as to possibility of major strikes in the near future. Noteworthy was the West Edmond strike, in Hunton limestone, and the indication that the Bartlesville sand will also be found to be productive there. Geologists regard this find as representing stratigraphic trap accumulation, which suggests that a series of similar occurrences may exist, west of and parallel to the Granite Ridge, in central Oklahoma.

New Anadarko Basin production was proved in spectacular fashion in November by the opening of the West Moore field in Cleveland County, at the eastern edge of the basin. Here, an 8800-foot well found an excellent second Wilcox pay. The deeply-buried, faulted anticline of the West Moore structure is only one of many such structures that have been mapped by seismograph and yet to be tested west of the Nemaha Ridge zone of weakness. This area looks like one of the greatest potential producing areas in the Mid-Continent region.

Another deep-seated anticline was successfully explored in Washita County, in southwestern Oklahoma, proving production from several zones in granite wash. Earlier granite wash discoveries to the east, in previous years, were not especially noteworth, but this recent discovery promises to be more prolific.

Nothing Big Found In Arkansas

Of the 71 strict wildcats drilled in Arkansas in 1943, only 6 were productive. Four new fields were discovered and two new pays were proved in existing fields. The state's reserve picture was improved by repeal of the ruling against dual completions in Arkansas fields. With the waiving of this regulation an immediate campaign of dual completions was initiated—bringing in production from Cotton Valley and Smackover formations in several fields.

The most significant Arkansas discoveries of the year were those opening the Hampton pool, for first production in Calhoun County, and the Weysinger pool, in Miller County. The latter field is expected to be carried south into Louisiana as development proceeds. The proving of Cotton Valley production in the West Atlanta field may lead to extensions of its pay area throughout the Atlanta field as well, since Smackover and Cotton Valley producion now appear to compliment each other.

Mississippi Picks Up

Completion of 54 wildcat wells in Mississippi during the past year resulted in the discovery of four new fields and proving of a new pay. As the year closed, a fifth new field was promised at Heidelberg, in Jasper County, with the completion of a good well there, flowing from 4900 feet, but not officially tested for production before the first day of January.

Only one discovery was made in the state in 1942; and with the better showing in 1943 the prospects for the year ahead looked brighter—especially since activities were being speeded up toward the close of the year and were assured of continuation as the new year opened, if necessary materials are available to allow operators to make good on commitments and schedules.

Major Strike in Louisiana

Although both wildcat drilling and discoveries were below the 1942 level in South Louisiana, the proving of the Frio at 5 levels in the Vinton Dome field, Calcasieu Parish, was a development that promises to lead to extensive re-exploration of salt dome structures in the upper Gulf Coast region.

The state's outstanding discovery of 1943, however, was the finding of the Tuscaloosa pay in the Holly Ridge area of Tensas Parish. Not only is this strike a major field discovery, but it touched off a widespread drilling play along the high trend extending across Mississippi.

While major finds were a rarity in Louisiana in 1943, the state's discovery record was something for all other states to shoot at in 1944. Out of 104 straight wildcats and new-pay exploration holes drilled there last year, 31 were completed as discovery wells. Kentucky, with 21 out of 40, and Wyoming, with 6 out of 15, were the only states with better scores, but explorations were considerably less extensive and numerous in the latter areas.

New Mexico Has Off Year

A total of 65 exploratory holes were drilled in New Mexico in 1943, resulting in 6 minor discoveries. Five oil strikes remained 1-well pools at the end of the year, all of them on pump since completion. They are in Eddy and Lea counties.

In San Juan County a deep gas well was found to be carrying helium in commercially recoverable amounts.

Greater wildcat activity is expected in the state in 1944. Ordovician beds have not yet been explored in Eddy County, and nothing below Upper Ordovician beds have been tested in Lea County.

Editorial Index to 1943 Issues Available Upon Request

Due to the paper shortage, THE OIL WEEKLY again is deviating from its long-standing previous custom of incorporating its Annual Editorial Index in one of its regular issues mailed to all subscribers. The complete editorial index covering all issues of THE OIL WEEKLY published during 1943, bound separately in convenient pamphlet form, will be sent without charge to each subscriber requesting a copy.

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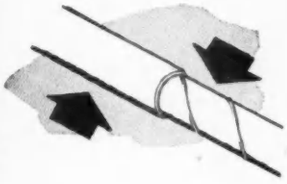

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Producing Oil Wells in United States at End of Year and Daily Average Production Per Well During Year

Figures for 1940-1943 by The Oil Weekly, with cooperation of state conservation officials and others; earlier years by the Bureau of Mines.

YEAR	Number of Producing Oil Wells at End of Year	*Bbls. Prod. Per Well Per Day During Year
1921	274,500	4.9
1922	284,880	5.7
1923	290,100	6.6
1924	299,100	6 2
1925	306,100	6.5
1926	318,600	6.8
1927	323,300	7.7
1928	327,800	7.6
1929	328,200	8.4
1930	331,070	7.5
1931	315,850	7.2
1932	321,500	6.7
1933	326,850	7.7
1934	333,070	7.5
1935	340,990	8.1
1936	349,450	8.7
1937	363,030	9.8
1938	369,640	9.1
1939	380,390	9.2
1940	393,516	9.5
1941	403,582	9.7
1942	407,257	9.3
1943	410,125	10.1
Change, 1941-1942	+3,675	— 0.4
Change, 1942-1943	+2,868	+ 0.8
Percent Change 1941-42	+0.9	— 4.1
Percent Change, 1942-43	+0.7	+ 8.6

* Daily average production for years divided by average number of wells on production during year, that is, between January 1 and December 31.

Subnormal Gain in U. S. Producing Oil Wells

IN RESPONSE to the call for more crude oil in 1943, the industry kept as many old wells on production as possible and completed as many producers as the subnormal drilling program permitted, with the result that there was a net gain of 2868 during the year in the number of producing oil wells. The total was increased to 410,125 at the end of 1943 from 407,257 a year previously.

In spite of the gain in number of producing wells, long-range statistics show that this 1943 result was highly unsatisfactory, the gain having been far short of normal and not at all in line with the sharp stepping up of production to fill essential requirements. As against the net gain of only 2868 in number of producing oil wells in 1943, the industry during the 12 years since the end of 1931 increased total producing oil wells on the average by 7856 per year. And in the 5 years from the end of 1936 to the end of 1941, the increase of oil-producing wells averaged 10,826 per year.

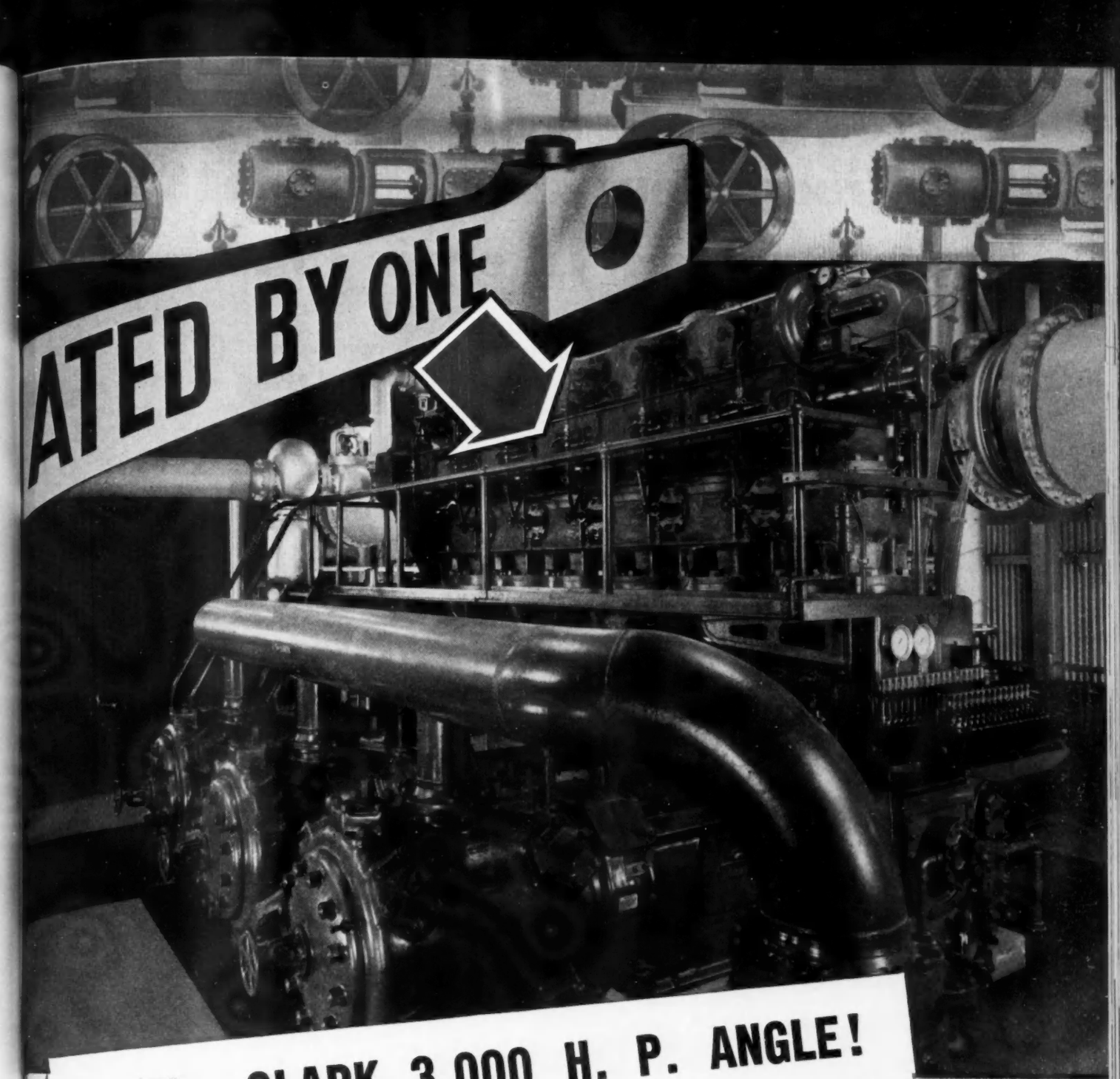
Concrete proof of the inadequacy of the 1943 build-up in the number of producing oil wells is given in accompanying statistics which show that it was necessary to draw heavily on wells able to turn out more oil. The average daily production per well was stepped up to a record high of 10.1 barrels in 1943, from only 9.3 barrels daily per well during 1942. And of course, this increase was achieved by materially expanding output of the better wells which had additional producing ability.

Producing Oil Wells Increased to New Peak at End of 1943, and Output Per Well Also at New High, in Spite of Further Slight Decline in Number of Wells Flowing

(Data compiled by The Oil Weekly, with cooperation of state conservation departments and others.)

STATE OR DISTRICT	FLOWING OIL WELLS			OIL WELLS PRODUCING BY ARTIFICIAL LIFT			TOTAL PRODUCING OIL WELLS			DAILY AVERAGE PRODUCTION PER WELL AT END OF YEAR		
	End of 1942	End of 1943	Percent Change	End of 1942	End of 1943	Percent Change	End of 1942	End of 1943	Percent Change	1942	1943	Percent Change
Arkansas	327	350	+ 7.0	2,721	2,607	— 4.2	3,048	2,957	— 3.0	24.3	27.5	+ 13.2
California	1,714	1,698	— 0.9	17,080	18,315	+ 7.2	18,794	20,013	+ 6.5	41.2	40.0	— 2.9
San Joaquin Valley	818	849	+ 3.8	9,302	10,263	+ 10.3	10,120	11,112	+ 9.8	34.6	33.6	— 2.9
Coastal District	305	359	+ 17.7	1,476	1,504	+ 1.9	1,781	1,863	+ 4.6	63.6	63.9	+ 0.5
Los Angeles Basin	591	490	— 17.1	6,302	6,548	+ 3.9	6,893	7,038	+ 2.1	45.0	43.9	— 2.4
Colorado	18	19	+ 5.6	148	143	— 3.4	166	162	— 2.4	37.3	42.3	+ 13.4
Florida	.....	.....	.....	.....	1	+	.....	1	+	.....	100.0	+
Illinois	300	260	— 13.3	24,883	25,777	+ 3.6	25,183	26,037	+ 3.4	9.9	8.4	— 15.1
Indiana	.....	.....	.....	1,931	1,827	— 5.4	1,931	1,827	— 5.4	8.2	7.5	— 8.5
Kansas	336	410	+ 22.0	22,024	25,415	+ 15.4	22,360	25,825	+ 15.5	12.8	10.4	— 18.7
Kentucky	.....	9	+	14,300	14,197	— 0.7	14,300	14,206	— 0.7	1.1	1.7	+ 54.5
Louisiana	2,396	2,511	+ 4.8	4,924	4,474	— 9.1	7,320	6,985	— 4.6	41.3	50.5	+ 22.3
North Louisiana	552	558	+ 1.1	3,865	3,540	— 8.4	4,417	4,098	— 7.2	18.3	19.0	+ 3.8
South Louisiana	1,844	1,953	+ 5.9	1,059	934	— 11.8	2,903	2,887	— 0.6	76.4	95.4	+ 28.9
Michigan	235	178	— 24.3	2,835	3,138	+ 10.7	3,070	3,316	+ 8.0	19.6	16.0	— 18.4
Mississippi	.....	15	+	348	358	+ 2.9	348	373	+ 7.2	172.7	125.6	— 27.3
Missouri	.....	.....	.....	94	128	+ 36.2	94	128	+ 36.2	1.0	1.6	+ 60.0
Montana	.....	8	+	2,244	2,112	— 5.9	2,244	2,120	— 5.5	9.7	9.6	— 1.0
Nebraska	.....	.....	.....	88	92	+ 4.5	88	92	+ 4.5	28.4	17.7	— 37.7
New Mexico	2,821	2,662	— 5.6	1,004	1,218	+ 21.3	3,825	3,880	+ 1.4	24.0	29.3	+ 22.1
New York	.....	.....	.....	21,300	22,190	+ 4.2	21,300	22,190	+ 4.2	0.6	0.59	— 1.7
Ohio	.....	.....	.....	25,600	23,350	— 8.8	25,600	23,350	— 8.8	0.3	0.38	+ 26.7
Oklahoma	400	425	+ 6.3	52,611	51,738	— 1.7	53,011	52,163	— 1.6	6.7	6.3	— 6.0
Pennsylvania	.....	.....	.....	84,800	85,000	+ 0.2	84,800	85,000	+ 0.2	0.5	0.47	— 6.0
Tennessee	.....	.....	.....	30	28	— 6.7	30	28	— 6.7	1.1	1.2	+ 9.1
Texas*	38,619	37,619	— 2.6	60,281	60,774	+ 0.8	98,900	98,393	— 1.5	13.7	19.6	+ 43.1
Dist. 1 (South Central Texas)	69	81	+ 17.4	3,673	3,354	— 8.7	3,742	3,435	— 8.2	5.0	6.4	+ 28.0
Dist. 2 (Lower Gulf: Refugio)	2,130	2,169	+ 1.8	605	629	+ 4.0	2,735	2,798	+ 2.3	28.2	50.5	+ 79.1
Dist. 3 (Upper Gulf Coast)	5,379	5,181	— 3.7	2,732	2,852	+ 4.4	8,111	8,033	— 1.0	34.2	59.4	+ 73.7
Dist. 4 (Lower Gulf—S.W. Texas)	2,772	2,558	— 7.7	5,342	5,556	+ 4.0	8,114	8,114	.....	12.8	22.0	+ 71.9
Dist. 5 (East Central Texas)	351	327	— 6.8	1,396	1,368	— 2.0	1,747	1,695	— 3.0	10.5	19.1	+ 81.9
Dist. 6 (East Texas Field)	16,905	16,258	— 3.8	8,435	8,344	— 1.1	25,340	24,602	— 2.9	13.9	15.4	+ 10.8
Dist. 6 (Rest of East Texas)	875	871	— 0.5	1,285	1,348	+ 4.9	2,160	2,219	+ 2.7	34.6	48.4	+ 39.9
Dist. 7-B (West Central Texas)	415	455	+ 9.6	6,465	6,387	— 1.2	6,880	6,842	— 0.6	3.4	3.9	+ 14.7
Dist 7-C (West Texas)	88	97	+ 10.2	1,186	1,187	+ 0.1	1,274	1,284	+ 0.8	13.7	14.3	+ 4.4
Dist. 8 (West Texas)	7,709	7,882	+ 2.2	6,090	6,426	+ 5.5	13,799	14,308	+ 3.7	14.0	23.4	+ 67.1
Dist. 9 (North Texas)	1,889	1,703	— 9.8	17,609	17,682	+ 0.4	19,498	19,385	— 0.6	5.8	6.1	+ 5.2
Dist. 10 (Texas Panhandle)	37	37	—	5,463	5,641	+ 3.3	5,500	5,678	+ 3.2	15.9	15.4	— 3.1
Utah	.....	.....	.....	5	5	.....	5	5	.....	3.2	3.0	— 6.7
West Virginia	.....	.....	.....	17,900	17,400	— 2.8	17,900	17,400	— 2.8	0.5	0.49	— 2.0
Wyoming	104	186	+ 78.8	2,836	3,488	+ 23.0	2,940	3,674	+ 25.0	29.2	27.1	— 7.2
Total United States	47,270	46,350	— 1.9	359,987	363,775	+ 1.1	407,257	410,125	+ 0.7	9.5	10.8	+ 13.7

* District numbers are those into which Texas is divided by Texas Railroad Commission in administering proration. Figures given here are commission's figures for November and differ slightly from those on producing wells embodied in tables in this issue giving production and drilling data by individual fields, the latter being data for October.



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CLARK

U. S. Production At Peak During 1943; New Mark Likely in 1944

Increased demand apparently will require all petroleum that country can produce; gross annual figure for record year is billion and half barrels or 7.1 percent more than for 1941

WELLS of the United States produced a record volume of petroleum during 1943, and all indications point to an even higher peak for 1944. At the close of the year, production was approximately 500,000 barrels more daily than 12 months previously, and a continuation of this rate would assure another substantial gain in annual crude production. There appears no likelihood that consumption will not require all the oil that the country may be physically able to produce next year, in fact it is probable that before the close of the year demand will exceed the producing ability of the nation. Consequently, oil wells of the United States will be called upon to produce even more than they were producing at the end of 1943.

Production statistics by states for all years shown on pages 114-115. Production statistics by fields for 1943 and cumulative begin on page 146.

Gross annual crude production of the United States amounted to 1,501,905,000 barrels in 1943, an increase of 8.3 percent over 1942. The previous record of 1,402,228,000 barrels produced in 1941 was exceeded last year by almost exactly 100 million barrels, or 7.1 percent.

Texas, with 592,884,000 barrels, again was far ahead of all other states, and approximately 110 million barrels above the amount it produced in 1942. This state is expected to further increase its yield, which by the end of 1943 amounted to 43 percent of the national total, during 1944.

California produced 283,880,000 barrels, an all-time high for that state. Unlike Texas, however, California cannot hope to continue at such a high level, unless some new major reserves are brought into production immediately.

Other leading oil-producing states either posted less significant increases or fell off in production during the past year. Among those registering gains

United States Crude Oil Production by States and Major Districts, Cumulative and in Years 1941, 1942 and 1943

All data from U. S. Bureau of Mines except estimates for last 2 months of 1943, made with aid of American Petroleum Institute weekly reports, and except breakdown of Texas by major districts, compiled from reports of Texas Railroad Commission and private records.

STATE	Cumulative Production To End of 1943		ANNUAL PRODUCTION								
			1941		1942			1943			
	Amount (Thousands of Barrels)	Percent of U.S.	Amount (Thousands of Barrels)	Percent of U.S.	Amount (Thousands of Barrels)	Percent Change from 1941	Percent of U.S.	Amount (Thousands of Barrels)	Percent Change from 1941	Percent Change from 1942	Percent of U.S.
Arkansas	586,942	2.1	26,327	1.9	26,628	+ 1.1	1.9	27,570	+ 4.7	+ 3.5	1.8
California	6,332,547	22.5	230,263	16.4	248,326	+ 13.9	17.9	283,880	+ 23.3	+ 14.3	18.9
Colorado	46,592	0.2	2,150	0.2	2,199	+ 2.3	0.2	2,347	+ 9.2	+ 6.7	0.2
Florida	2	0.0	.....	.....	.....	.....	.....	2	+	+	0.0
Illinois	1,020,523	3.6	132,393	9.4	106,391	— 19.6	7.7	82,067	— 38.0	— 22.9	5.5
Indiana	150,513	0.6	7,411	0.5	6,743	— 9.0	0.5	5,249	— 29.2	— 21.5	0.4
Kansas	1,381,516	4.9	83,242	5.9	97,636	+ 17.3	7.0	106,060	+ 27.4	+ 8.6	7.0
Kentucky	184,360	0.7	4,762	0.4	4,534	— 4.8	0.33	7,903	+ 65.9	+ 74.3	0.5
Louisiana	1,415,591	5.0	115,908	8.3	115,785	— 0.11	8.3	123,909	+ 6.9	+ 7.0	8.3
North Louisiana	597,431	2.1	24,991	1.8	29,310	+ 17.3	2.1	27,953	+ 11.9	— 4.6	1.9
South Louisiana	818,160	2.9	90,917	6.5	86,475	— 4.8	6.2	95,956	+ 5.5	+ 11.0	6.4
Michigan	203,882	0.7	16,359	1.2	21,754	+ 33.0	1.6	20,663	+ 26.3	— 5.0	1.4
Mississippi	67,656	0.3	15,327	1.1	28,883	+ 88.4	2.1	18,989	+ 23.9	— 34.3	1.3
Missouri	257	0.0	47	0.0	36	— 23.4	0.0	36	— 23.4	.....	0.0
Montana	106,849	0.4	7,526	0.5	8,074	+ 7.3	0.6	7,757	+ 3.1	— 3.9	0.5
Nebraska	4,082	0.0	1,898	0.1	1,237	— 34.8	0.1	669	— 64.8	— 45.9	0.0
New Mexico	384,365	1.4	39,569	2.8	31,544	— 20.3	2.3	38,493	— 2.7	+ 22.0	2.6
New York	144,794	0.5	5,185	0.4	5,421	+ 4.6	0.4	5,001	— 3.5	— 7.7	0.3
Ohio	598,707	2.1	3,510	0.3	3,543	+ 9.4	0.2	3,277	— 6.6	— 7.5	0.2
Oklahoma	5,250,610	18.7	154,702	11.0	140,690	— 9.1	10.1	122,740	— 20.7	— 12.8	8.2
Pennsylvania	1,036,828	3.7	16,750	1.2	17,779	+ 6.1	1.3	15,641	— 6.6	— 12.0	1.0
Tennessee	436	0.0	12	0.0	9	— 25.0	0.0	12	.....	+ 33.3	0.0
Texas*	8,161,360	29.0	505,572	36.1	483,097	— 4.4	34.8	592,884	+ 17.3	+ 22.7	39.5
East Texas Field	1,969,319	7.0	131,367	9.4	121,329	— 7.6	8.7	128,485	— 2.2	+ 5.9	8.6
Rest of East Texas	615,202	2.2	28,943	2.1	31,940	+ 10.4	2.3	42,713	+ 47.6	+ 33.7	2.8
North Texas	736,690	2.6	38,293	2.7	40,300	+ 5.2	2.9	40,177	+ 4.9	— 0.31	2.7
West Central Texas	431,208	1.5	11,243	0.8	10,424	— 7.3	0.8	10,322	— 8.2	— 0.98	0.69
West Texas	1,376,926	4.9	92,305	6.6	81,021	— 12.2	5.8	98,484	+ 6.7	+ 21.6	6.5
Texas Panhandle	473,854	1.7	27,901	2.0	30,833	+ 10.5	2.2	33,465	+ 19.9	+ 8.5	2.2
Gulf Coast, Upper	1,670,996	5.9	97,626	7.0	103,226	+ 5.7	7.4	151,440	+ 55.1	+ 46.7	10.1
Gulf Coast, Lower	401,432	1.4	42,896	3.1	36,336	— 15.3	2.6	53,178	+ 24.0	+ 46.4	3.5
Southwest Texas	270,984	1.0	26,483	1.9	19,891	— 24.9	1.4	23,271	— 12.1	+ 17.0	1.5
South Central Texas	229,014	0.8	6,786	0.5	6,337	— 6.6	0.5	6,461	— 4.8	+ 2.0	0.43
Utah	16	0.0	4	0.0	.....	—100.0	.....	5	+ 25.0	+	0.0
West Virginia	421,115	1.5	3,433	0.2	3,574	+ 4.1	0 3	3,338	— 2.8	— 6.6	0.2
Wyoming	597,081	2.1	29,878	2.1	32,812	+ 9.8	2.4	33,413	+ 11.8	+ 1.8	2.2
Unclassified	572	0.0	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total United States	28,097,196	100.0	1,402,228	100.0	1,386,645	— 1.1	100.0	1,501,905	+ 7.1	+ 8.3	100.0

* Data by districts, compiled from other sources, differ slightly from Texas total, which is on Bureau of Mines basis.

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It is our job to produce Jones Sucker Rods that will help you solve your production problem — to produce rods that have longer service life, require less shut-down time and lost production for repairs or replacements. Jones Sucker Rods can and do stand up better under tougher field and individual well conditions—lift maximum production loads at higher speeds and at lower costs.

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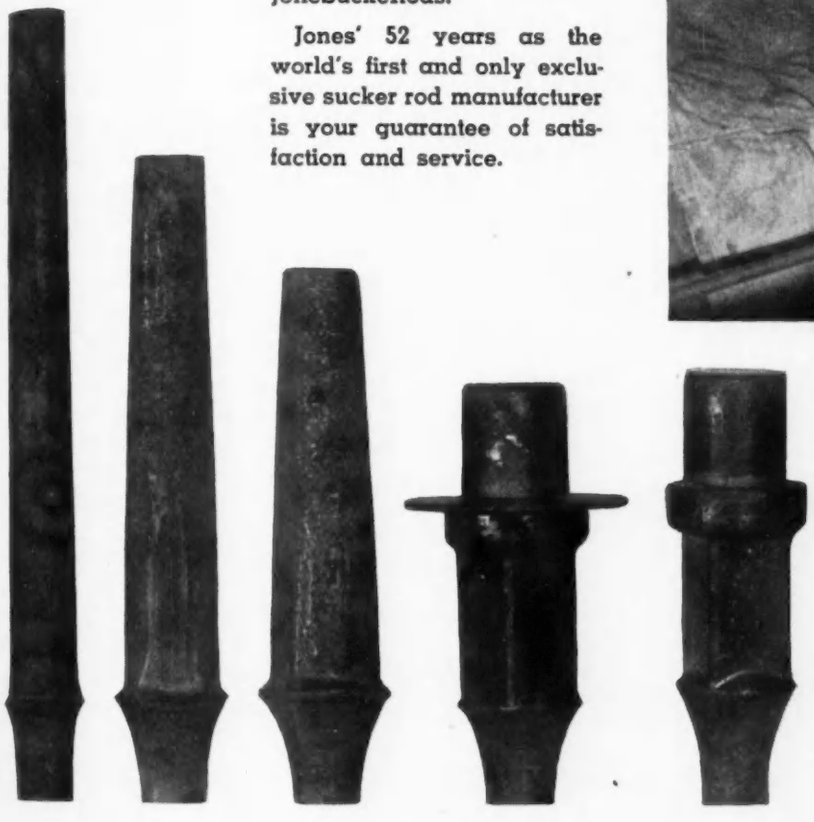

METAL "FLOWS" INTO PLACE IN FORGING JONES RODS

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were Louisiana, which jumped from 115,785,000 barrels in 1942 to 123,909,000 barrels in the past year; and Kansas, which showed a gain of approximately 8,500,000 barrels. Previous production records were exceeded in both of these states.

Oklahoma was off almost 18,000,000 barrels from the previous year; and Illinois continued down the curve from her all-time peak of 147,647,000 barrels produced in 1940, to 82,067,000 barrels—more than 24,000,000 below the 1942 figure for that state.

Small gains were made by Arkansas, New Mexico, Wyoming and Kentucky; but Michigan, Mississippi, Pennsylvania and Indiana all showed declines. Some increase can be expected in the case of Wyoming in 1944, since it has just finished a successful wildcatting year, opening new reserves that should be well developed in coming months.

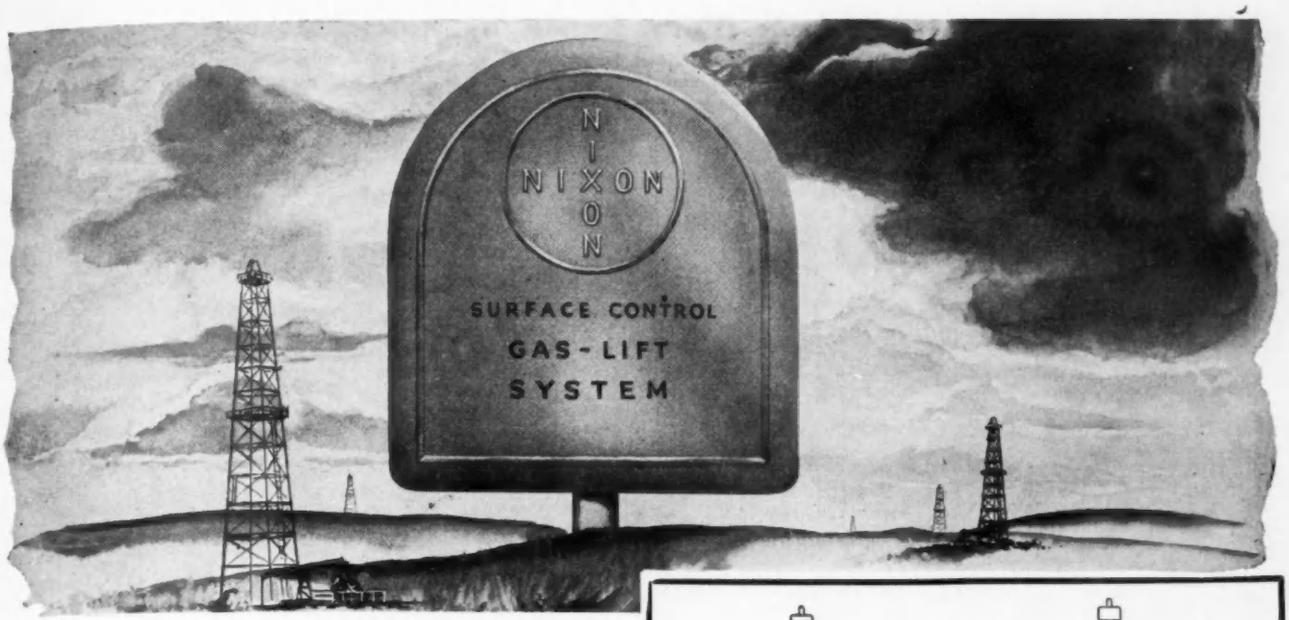
Leading Fields in Current Daily Average Production

FIELD	State or District	Year Found	PRODUCTION AT END OF 1943		
			Number of Oil Wells Producing	Daily Av. Per Well (Barrels)	Daily Av. Whole Field (Barrels)
No. 1 Field:					
East Texas	Eastern Texas	1930	24,672	15	364,265
100,000-50,000 Barrels Daily:					
Wilmington	California	1937	1,163	83	96,314
Coalinga	California	1896	1,500	59	88,672
Conroe	Upper Texas Coast	1931	917	69	63,202
Hastings	Upper Texas Coast	1934	689	87	59,700
Friendswood	Upper Texas Coast	1937	214	265	56,800
50,000-30,000 Barrels Daily:					
Oklahoma City	Oklahoma	1928	838	59	49,800
Ventura Avenue	California	1926	431	111	47,901
Wasson	West Texas	1936	1,437	31	44,325
Tomoconnor	Lower Texas Coast	1934	448	97	43,647
Kettleman, North Dome	California	1928	269	157	42,189
Huntington Beach	California	1920	747	55	41,247
Slaughter	West Texas	1937	1,446	28	40,823
Midway-Sunset	California	1901	2,599	16	40,634
Tinsley	Mississippi	1939	332	122	40,550
Thompson	Upper Texas Coast	1931	341	108	36,825
Louden	Illinois	1937	1,940	18	35,200
Yates	West Texas	1926	566	57	32,100
Long Beach	California	1921	1,176	26	30,464
Anahuac	Upper Texas Coast	1935	353	86	30,207
30,000-20,000 Barrels Daily:					
Trapp	Kansas	1939	903	32	29,029
Van	Eastern Texas	1929	586	46	27,000
Talco	Eastern Texas	1936	730	35	25,560
Salem	Illinois	1938	2,396	11	25,750
North Cowden	West Texas	1930	562	44	24,585
Mount Poso	California	1927	455	52	23,601
Domingues	California	1923	301	76	22,874
Goldsmith	West Texas	1935	966	23	22,675
Silica	Kansas	1931	633	35	22,395
Monument	New Mexico	1935	497	43	21,500
Gulf-McElroy	West Texas	1926	590	36	21,000
20,000-15,000 Barrels Daily:					
Inglewood	California	1924	291	66	19,313
Santa Fe Springs	California	1921	560	34	19,242
Lance Creek	Wyoming	1918	220	87	19,220
Eunice	New Mexico	1928	483	40	19,100
Hawkins	Eastern Texas	1940	391	48	19,000
Reed City	Michigan	1940	183	91	16,690
Cole's Levee	California	1938	97	168	16,363
New Harmony Consolidated (Incl. Calvin)	Illinois	1939	710	22	15,800
Greeley	California	1936	83	190	15,737
Bemis-Shutts	Kansas	1935	453	34	15,562
Magnolia	Arkansas	1938	114	136	15,559
Ten Section	California	1936	117	132	15,499
Vacuum Lea	New Mexico	1928	344	44	15,300
Elk Hills	California	1919	231	66	15,280
Oregon Basin Park	Wyoming	1927	107	141	15,054
15,000-10,000 Barrels Daily:					
Rio Bravo	California	1937	99	150	14,865
Rodessa	La.-Texas-Ark.	1930	826	18	14,676
Belridge	California	1911	536	27	14,505
Buena Vista	California	1909	812	18	14,413
Cut Bank	Montana	1932	746	19	14,335
Seminole	West Texas	1937	298	48	14,300
Schuler	Arkansas	1937	65	216	14,064
Haynesville	N. Louisiana	1941	398	35	14,001
Old Ocean	Upper Texas Coast	1934	118	119	14,000
La Fitte	S. Louisiana	1935	58	231	13,400
Chalk	West Texas	1926	824	16	13,303
Salt Creek	Wyoming	1908	1,781	7	13,016
Cumberland	Oklahoma	1940	86	148	12,700
Foster	West Texas	1936	556	22	12,504
Burnett	Kansas	1937	209	60	12,441
Coyote, West	California	1909	154	80	12,396
Pauls Valley	Oklahoma	1942	50	240	12,000
Smackover	Arkansas	1922	1,585	8	11,895
Kern Front	California	1925	575	21	11,795
Chase	Kansas	1931	388	30	11,786
Round Mountain	California	1927	219	54	11,765
Brea-Olinda	California	1897	367	32	11,590
Hobbs	New Mexico	1929	251	46	11,550
Hall-Silk-Sikes	North Texas	1938	439	26	11,514
Paradis	S. Louisiana	1939	64	180	11,500
Elk Basin	Wyoming	1942	18	637	11,474
Santa Maria-Lompoc	California	1902	242	47	11,267
E. White Point	Lower Texas Coast	1938	233	48	11,115
Montebello	California	1917	345	31	10,840
Seeligson	Lower Texas Coast	1938	163	65	10,580
Nebo-Hemphill	N. Louisiana	1940	143	74	10,520
Dale-Hoodville	Illinois	1940	390	27	10,500
Kraft-Prusa	Kansas	1937	301	35	10,465
Raccoon Bend	Upper Texas Coast	1927	157	65	10,180

Fields That Have Produced Over 100 Million Barrels Each

FIELD	State or District	Year Found	Barrels in 1942	Barrels in 1943	Cumulative Through 1943
No. 1 Field:					
East Texas	Eastern Texas	1930	120,835,561	128,484,941	1,969,319,314
Around Billion Bbls.:					
Seminole Area*	Oklahoma	1926	33,954,700	27,287,700	1,210,732,000
½-¾ Billion Barrels:					
Long Beach	California	1921	13,135,518	11,627,450	691,745,151
Midway-Sunset	California	1901	20,475,029	14,957,233	658,461,031
Oklahoma City	Oklahoma	1928	26,297,315	20,274,290	591,718,366
Santa Fe Springs	California	1921	7,807,231	7,310,968	489,773,948
Coalinga	California	1896	19,235,599	31,384,381	436,759,264
300-400 Million Barrels:					
Smackover	Arkansas	1922	4,911,530	4,460,354	398,375,483
Cushing	E. C. Oklahoma	1912	3,068,700	2,979,040	365,406,756
Huntington Beach	California	1920	12,277,748	13,275,386	327,086,359
Salt Creek	Wyoming	1908	5,054,846	4,802,679	308,405,017
200-300 Million Barrels:					
Buena Vista	California	1909	5,296,479	5,278,373	292,711,765
Kern River	California	1900	5,751,518	3,103,822	287,561,175
Kettleman North Dome	California	1928	12,970,940	15,309,239	280,534,962
Yates	West Texas	1926	6,691,116	8,708,872	275,601,706
Ventura Avenue	California	1926	13,636,650	15,514,708	256,747,244
Glenn	E. C. Oklahoma	1905	1,460,700	1,720,610	223,775,410
Burbank	Osage Co. Area, Oklahoma	1920	3,355,800	3,251,725	211,770,625
Wilmington	California	1937	33,685,637	34,359,724	208,367,002
Hendricks	West Texas	1926	2,538,354	2,079,141	206,320,348
Electra	North Texas	1911	2,214,751	*2,000,000	146,867,199
150-200 Million Barrels:					
Healdton	S. E. Oklahoma	1913	2,826,900	2,623,100	195,999,600
El Dorado	Kansas	1917	2,547,300	2,433,425	184,861,424
Salem	Illinois	1938	14,731,300	10,165,840	177,717,768
Brea-Olinda	California	1897	4,740,087	4,260,980	177,052,119
Elk Hills	California	1919	4,388,808	5,365,780	167,550,554
St. Louis	Seminole Area, Oklahoma	1927	5,054,800	3,589,140	163,077,240
Santa Maria Lompoc	California	1902	2,748,568	3,777,529	163,080,928
Conroe	Upper Texas Coast	1931	13,499,571	19,957,155	161,943,397
Burkburnett	North Texas	1912	1,705,265	†1,750,000	159,558,256
Caddo	N. Louisiana	1904	2,985,700	2,410,255	157,875,157
100-150 Million Barrels:					
Domingues	California	1923	7,911,696	9,114,280	147,383,079
Electra	North Texas	1911	2,214,751	†2,000,000	146,867,199
Rodessa, Total	N. La.-Tex.-Ark.	....	8,292,105	5,938,332	139,717,673
Rodessa	N. Louisiana	1930	4,776,556	3,494,223	79,307,101
Rodessa	Arkansas	1937	367,567	212,081	6,819,602
Rodessa	Texas	1935	3,147,982	2,232,028	53,590,970
Inglewood	California	1924	6,763,872	6,912,750	139,495,634
Van	Eastern Texas	1929	3,383,700	6,216,418	138,622,304
Montebello	California	1917	3,981,338	3,960,339	135,364,449
Coyote, West	California	1909	3,774,144	4,438,766	134,289,135
Gulf McElroy	West Texas	1926	4,955,569	6,114,587	127,051,096
Seminole City	Seminole Area, Oklahoma	1926	1,983,500	1,815,180	132,638,380
Earlsboro	Seminole Area, Oklahoma	1926	1,122,900	991,340	127,589,040
Spindletop	Upper Texas Coast	1901	419,082	373,273	127,392,981
Humble	Upper Texas Coast	1904	840,045	797,334	128,362,904
Bowlegs	Seminole Area, Oklahoma	1926	1,894,185	1,718,450	122,742,450
Tonkawa	Kay Co., No. Okla.	1921	601,200	496,640	122,466,140
Powell	Eastern Texas	1900	558,490	509,588	116,366,755
Little River	Seminole Area, Oklahoma	1927	1,878,800	1,552,165	115,150,465
Torrance	California	1922	3,066,766	2,856,503	110,667,394
Hobbs	New Mexico	1928	2,979,177	3,821,575	104,717,768
Big Lake	West Texas	1923	1,896,802	1,812,589	102,427,268
Richfield	California	1919	2,751,387	2,681,154	101,124,451
Louden	Illinois	1937	17,966,000	13,809,090	100,849,102

* Seminole Area as shown in this table includes numerous pools of Hughes, Okfuskee, Pottawatomie, and Seminole counties. † Estimated.



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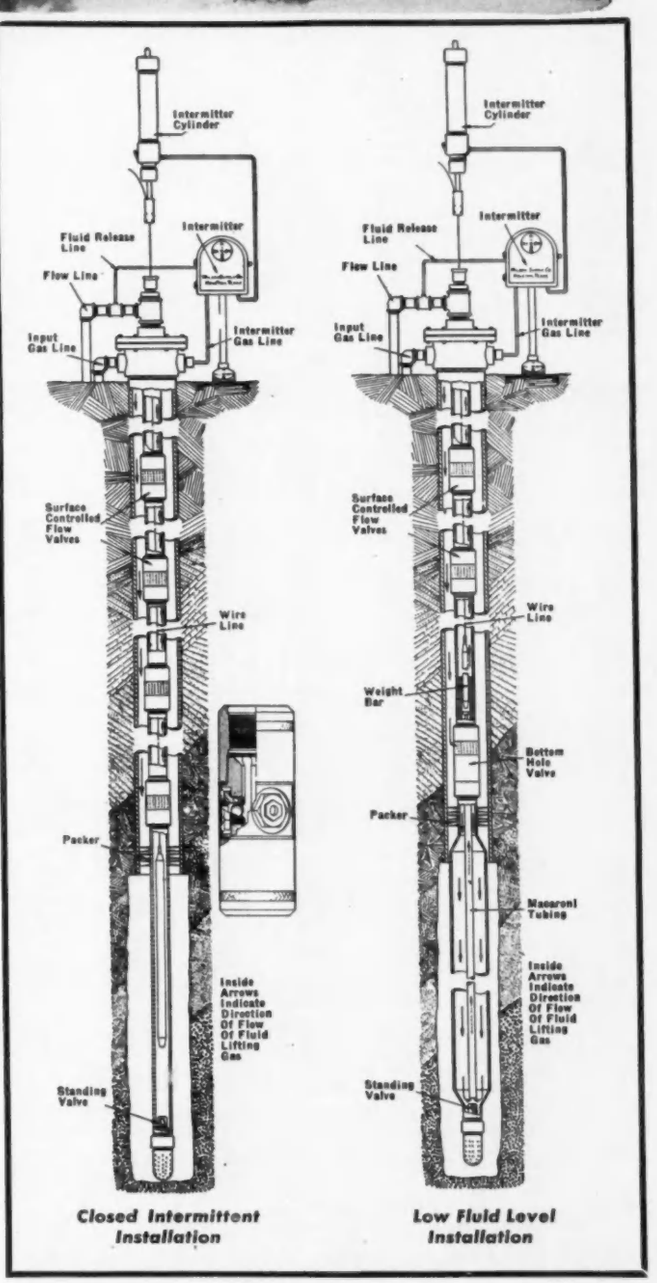

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United States Crude Oil Production, by States, by Years

(Complete production history of the nation, in thousands of barrels of 42 U. S. gallons. Sources—*Mineral Resources* and *Minerals Yearbook*, except where otherwise indicated in footnotes.)

YEAR	Arkansas	California	Colorado	Illinois	Indiana	Kansas	Kentucky	Louisiana	Michigan	Mississippi	Missouri	Montana	Nebraska	New Mexico
1859														
1860							E							
1861							E							
1862							E							
1863							E							
1864							E							
1865							E							
1866							E							
1867							E							
1868							E							
1869							E							
1870							E							
1871							E							
1872							E							
1873							E							
1874							E							
1875							E							
1876		12					G E							
1877		13					G E							
1878		15					G E							
1879		20					G E							
1880		40					G E							
1881		100					G E							
1882		129					G E							
1883		143					G5							
1884		262					G4							
1885		325					G5							
1886		377					G5							
1887		678	76				G5							
1888		690	298				G5							
1889		303	317	1	33	1	G5				H			
1890		307	369	1	64	1	G6				H			
1891		324	666	1	137	1	G9				H			
1892		385	824	1	698	5	G7				H			
1893		470	594	1	2,335	18	G3				H			
1894		706	516	H	3,689	40	G2				H			
1895		1,209	438	H	4,386	44	G2				H			
1896		1,253	361	H	4,681	114	G2				H			
1897		1,903	385	1	4,122	81	G H				H			
1898		2,257	444	H	3,731	72	G6				H			
1899		2,642	390	H	3,848	70	G18				H			
1900		4,325	317	H	4,874	75	G62		J		J2			
1901		8,787	461	H	5,757	179	G137		J		J2			
1902		13,984	397	H	7,481	332	G185	549	J		J1			
1903		24,382	484		9,186	932	G554	918	J		J3			
1904		29,649	501		11,339	4,251	G998	2,959	J		J3			
1905		33,428	376	181	10,964	I3,750	G1,217	8,910	J		J3			
1906		33,099	328	4,397	7,674	I3,627	G1,214	9,077	J		J3			
1907		39,748	332	24,282	5,128	2,410	G821	5,000	J		J4			
1908		44,855	380	33,686	3,283	1,801	728	5,789	J		J15			
1909		55,472	311	30,898	2,296	1,264	639	3,060	J		J6			
1910		73,011	240	33,143	2,160	1,128	469	6,841	J		J4			
1911		81,134	227	31,317	1,695	1,279	472	10,721	J		J8			
1912		87,269	206	28,602	970	1,593	484	9,263	K					
1913		97,788	189	23,894	956	2,375	525	12,499	K		K			K
1914		99,775	223	21,920	1,336	3,104	503	14,309	K		K			
1915		86,592	208	19,042	876	2,823	437	18,192	K		K			
1916		90,952	197	17,714	769	8,738	L1,202	15,248	K		K	45		
1917		93,878	121	15,777	760	36,536	L3,088	11,392	K			100		
1918		97,532	143	13,366	878	45,451	L4,368	16,043	K			69		
1919		101,183	121	11,960	972	33,048	9,278	17,188	K		K	90		K
1920	K	103,377	111	10,774	945	39,005	8,738	35,714			K	340		K
1921	10,473	112,600	108	10,043	1,158	36,456	9,013	27,103			K	1,509		K
1922	12,712	138,468	97	9,383	1,087	31,766	8,973	35,376			K	2,449		K
1923	36,610	262,876	86	8,707	1,043	28,250	8,069	24,919			K	2,782		K
1924	46,028	228,933	445	8,081	935	28,836	7,407	21,124				2,815		98
1925	77,398	232,492	1,226	7,863	829	38,357	6,759	20,272	4			4,091		1,060
1926	58,332	224,673	2,768	7,760	808	41,498	6,274	23,201	94			7,727		1,666
1927	40,005	231,196	2,831	6,994	852	41,069	6,719	22,818	439			5,058		1,226
1928	32,096	231,811	2,774	6,462	1,052	38,596	7,359	21,847	594			4,015		943
1929	24,917	292,534	2,358	6,319	981	42,813	7,775	20,554	4,528			3,980		1,830
1930	19,702	227,329	1,656	5,736	994	41,638	7,389	23,272	3,911			3,349		10,189
1931	14,791	188,830	1,545	5,039	840	37,018	6,456	21,804	3,789			2,830		15,227
1932	12,051	178,128	1,136	4,673	806	34,848	6,287	21,807	6,910		K	2,457		12,455
1933	11,686	172,010	919	4,244	737	41,976	4,608	25,168	7,942	K	K	2,273		14,116
1934	11,182	174,305	1,139	4,479	838	46,482	4,860	32,869	10,603	K	K	3,603		16,864
1935	11,008	207,832	1,560	4,322	777	54,843	5,258	50,330	15,776	K	K	4,603		20,483
1936	10,469	214,773	1,650	4,475	822	58,317	5,633	80,491	11,928		K	5,868		27,223
1937	11,764	238,521	1,605	7,499	844	70,761	5,484	90,924	16,628		K	5,805		38,854
1938	18,180	249,749	1,412	24,075	995	60,064	5,821	95,208	18,745		K	4,946		35,759
1939	21,238	224,354	1,404	94,912	1,711	60,703	5,621	93,646	23,462	107	40	5,960	2	37,637
1940	25,775	223,881	1,626	147,647	4,978	66,139	5,188	103,584	19,753	4,400	44	6,728	276	39,129
1941	26,327	230,263	2,150	132,393	7,411	83,242	4,762	115,908	16,359	15,327	47	7,526	1,898	39,569
1942	26,628	248,326	2,199	106,391	6,743	97,636	4,534	115,785	21,754	28,833	36	8,074	1,237	31,544
1943P	27,570	283,880	2,347	82,067	5,249	106,060	7,903	123,909	20,663	18,989	36	7,757	669	38,493
Total	586,942	6,332,547	46,592	1,020,523	150,513	1,381,516	184,360	1,415,591	203,882	67,656	257	106,849	4,082	384,365

A Utah production estimated at 3,650 barrels in 1939; 3,126 barrels in 1940; and 189,726 barrels cumulative through 1940.

B *Petroleum in the United States and Possessions*, by Arnold and Kemnitzer, shows for Alaska the following data: 1904-1919, estimated, 56,000 barrels; 1920, 11,000 barrels; 1921, 10,000 barrels; 1922-1928, estimated, 73,000 barrels; total, 1904-1928, 150,000 barrels.

C "Unclassified" includes 1912, Alaska and Michigan; 1913, Alaska, Michigan, Missouri and New Mexico; 1914-16, Alaska, Michigan and Missouri; 1917-18, Alaska and Michigan; 1919, Alaska, Michigan, Missouri and New Mexico; 1920, Alaska, Arkansas, Missouri, New Mexico and Utah; 1921-23, Alaska, Missouri and New Mexico; 1924-31, Alaska and Utah; 1932, Alaska, Missouri and Utah; 1933, Alaska, Mississippi, Missouri and Utah; 1934, Mississippi, Missouri and Utah; 1935, Mississippi, Missouri, Tennessee and Utah; 1936-40, Missouri, Tennessee and Utah.

D Pennsylvania and New York separated in years 1864-1881, by aid of *Petroleum in the United States and Possessions*, by Arnold and Kemnitzer.

E *Petroleum in the United States and Possessions*, by Arnold and Kemnitzer, gives the following additional estimates which are not shown by the official *Mineral Resources:* Ohio, 1860-1875, 200,000 barrels; West Virginia, 1860-1875, 2,800,000 barrels; Kentucky, 1860-1882, 161,000 barrels.

United States Crude Oil Production, by States, by Years—(Continued)

(Complete production history of the nation, in thousands of barrels of 42 U. S. gallons. Sources—*Mineral Resources* and *Minerals Yearbook*, except where otherwise indicated in footnotes.)

New York	Ohio	Oklahoma	Pennsylvania	Tennessee	Texas	[A] Utah	West Virginia	Wyoming	[B] Alaska	[C] Unclassified	Total United States	Total Value At Wells (Thousands of Dollars)	[O] Average Value Per Bbl.	YEAR
.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	2	$ 32	$20.00	1859
.....	[E]	.....	500	.....	.....	.....	[E]	.....	.....	.....	500	4,800	9.60	1860
.....	[E]	.....	2,114	.....	.....	.....	[E]	.....	.....	.....	2,114	1,036	.52	1861
.....	[E]	.....	3,057	.....	.....	.....	[E]	.....	.....	.....	3,057	3,210	1.05	1862
.....	[E]	.....	2,611	.....	.....	.....	[E]	.....	.....	.....	2,611	8,226	3.15	1863
[D F]	[E]	.....	[D F]2,116	.....	.....	.....	[E]	.....	.....	.....	2,116	20,897	8.15	1864
[D]100	[E]	.....	[D]2,398	.....	.....	.....	[E]	.....	.....	.....	2,498	16,460	6.59	1865
[D]144	[E]	.....	[D]3,454	.....	.....	.....	[E]	.....	.....	.....	3,598	13,455	3.75	1866
[D]134	[E]	.....	[D]3,213	.....	.....	.....	[E]	.....	.....	.....	3,347	8,067	2.40	1867
[D]146	[E]	.....	[D]3,500	.....	.....	.....	[E]	.....	.....	.....	3,646	13,217	3.62	1868
[D]169	[E]	.....	[D]4,046	.....	.....	.....	[E]	.....	.....	.....	4,215	23,730	5.60	1869
[D]211	[E]	.....	[D]5,050	.....	.....	.....	[E]	.....	.....	.....	5,261	20,504	3.90	1870
[D]208	[E]	.....	[D]4,997	.....	.....	.....	[E]	.....	.....	.....	5,205	22,591	4.40	1871
[D]252	[E]	.....	[D]6,041	.....	.....	.....	[E]	.....	.....	.....	6,293	21,440	3.75	1872
[D]396	[E]	.....	[D]9,498	.....	.....	.....	[E]	.....	.....	.....	9,894	18,100	1.80	1873
[D]437	[E]	.....	[D]10,490	.....	.....	.....	[E]	.....	.....	.....	10,927	12,648	1.15	1874
[D]352	[E]	.....	[D]8,436	.....	.....	.....	[E]	.....	.....	.....	8,788	7,368	.97	1875
[D]359	32	.....	[D]8,610	[G]	.....	.....	120	.....	.....	.....	9,133	22,983	2.52	1876
[D]525	30	.....	[D]12,610	[G]	.....	.....	172	.....	.....	.....	13,350	31,789	2.38	1877
[D]607	38	.....	[D]14,557	[G]	.....	.....	180	.....	.....	.....	15,397	18,045	1.17	1878
[D]787	29	.....	[D]18,898	[G]	.....	.....	180	.....	.....	.....	19,914	17,211	.86	1879
[D]1,041	39	.....	[D]24,987	[G]	.....	.....	179	.....	.....	.....	26,286	24,601	.94	1880
[D]1,095	34	.....	[D]26,281	[G]	.....	.....	151	.....	.....	.....	27,661	25,448	.92	1881
6,685	40	.....	23,368	[G]	.....	.....	128	.....	.....	.....	30,350	23,631	.78	1882
4,004	47	.....	19,125	[G]	.....	.....	126	.....	.....	.....	23,450	25,790	1.10	1883
3,231	90	.....	20,541	[G]	.....	.....	90	.....	.....	.....	24,218	20,596	.85	1884
2,658	662	.....	18,118	[G]	.....	.....	91	.....	.....	.....	21,859	19,198	.88	1885
2,151	1,783	.....	23,647	[G]	.....	.....	102	.....	.....	.....	28,065	19,996	.71	1886
2,075	5,023	.....	20,281	[G]	.....	.....	145	.....	.....	.....	28,283	18,877	.67	1887
1,789	10,011	.....	14,700	[G]	.....	.....	119	.....	.....	.....	27,612	17,948	.65	1888
1,897	12,472	.....	19,591	[G]	[H]	.....	544	.....	.....	.....	35,164	26,963	.77	1889
1,658	16,125	.....	26,800	[G]	[H]	.....	493	.....	.....	.....	45,824	35,365	.77	1890
1,585	17,740	[H]	31,424	[G]	[H]	.....	2,406	.....	.....	.....	54,293	30,527	.56	1891
1,273	16,363	[H]	27,149	[G]	[H]	.....	3,810	.....	.....	.....	50,515	25,907	.51	1892
1,032	16,249	[H]	19,283	[G]	[H]	.....	8,446	.....	.....	.....	48,431	28,950	.60	1893
942	16,792	[H]	18,078	[G]	[H]	.....	8,577	2	.....	.....	49,344	35,522	.72	1894
913	19,545	[H]	18,231	[G]	[H]	.....	8,120	4	.....	.....	52,892	57,632	1.09	1895
1,205	23,941	[H]	19,379	[G]	1	.....	10,020	3	.....	.....	60,960	58,519	.96	1896
1,279	21,561	1	17,983	[G]	66	.....	13,090	4	.....	.....	60,476	40,874	.68	1897
1,205	18,739	.....	14,743	[G]	546	.....	13,615	6	.....	.....	55,364	44,193	.80	1898
1,321	21,142	.....	13,054	[G]	669	.....	13,911	6	.....	.....	57,071	64,604	1.13	1899
1,301	22,363	6	13,258	[G]	836	.....	16,196	6	.....	.....	63,621	75,989	1.19	1900
1,207	21,648	10	12,625	[G]	4,394	.....	14,177	5	.....	.....	69,389	66,417	.96	1901
1,120	21,014	37	12,064	[G]	18,084	.....	13,513	6	.....	.....	88,767	71,179	.80	1902
1,163	20,480	139	11,355	[G]	17,956	.....	12,900	9	.....	.....	100,461	94,694	.94	1903
1,113	18,877	1,367	11,126	[G]	22,241	.....	12,645	12	[N]	.....	117,081	101,175	.86	1904
1,118	16,347	[I]8,264	10,437	[G]	28,136	.....	11,578	8	.....	.....	134,717	84,157	.62	1905
1,243	14,788	[I]18,091	10,257	[G]	12,568	.....	10,121	7	.....	.....	126,494	92,445	.73	1906
1,212	12,207	43,524	10,000	[G]	12,323	[M]	9,095	[M]9	[N]	.....	166,095	120,107	.72	1907
1,160	10,859	45,799	9,424	.....	11,207	[M]	9,523	[M]18	.....	.....	178,527	129,079	.72	1908
1,135	10,633	47,859	9,299	.....	9,534	[M]	10,745	[M]20	.....	.....	183,171	128,329	.70	1909
1,054	9,916	52,029	8,795	.....	8,899	[M]	11,753	[M]115	.....	.....	209,557	127,900	.61	1910
953	8,817	56,069	8,248	.....	9,526	[M]	9,796	[M]187	[N]	.....	220,449	134,045	.61	1911
874	8,969	51,427	7,838	.....	11,735	[M]	12,129	[M]1 572	[K]	4	222,935	164,213	.74	1912
948	8,781	63,579	7,917	.....	15,010	[N]	11,567	2,407	[K]	11	248,446	237,121	95	1913
939	8,536	73,632	8,170	.....	20,068	[N]	9,680	3,560	[K]	8	265,763	214,125	.81	1914
888	7,825	97,915	7,838	.....	24,943	[N]	9,265	4,246	[K]	14	281,104	179,463	.64	1915
874	7,744	107,072	7,593	[L]1	27,645	[N]	8,731	6,234	[K]	8	300,767	330,900	1.10	1916
880	7,751	107,508	7,733	[L]12	32,413	[N]	8,379	8,978	[K]	10	335,316	522,635	1.56	1917
809	7,285	103,347	7,408	[L]8	38,750	[N]	7,867	12,596	[K]	8	355,928	703,944	1.98	1918
851	7,736	86,911	8,137	15	79,366	[N]	8,327	13,172	[K]	12	378,367	760,266	2.01	1919
906	7,400	106,206	7,438	14	96,868	[K]	8,249	16,831	[K]	13	442,929	1,360,745	3.07	1920
988	7,335	114,634	7,418	12	106,166	.....	7,822	19,333	[K]	12	472,183	814,745	1.73	1921
1,000	6,781	149,571	7,425	10	118,684	.....	7,021	26,715	[K]	13	557,531	895,111	1.61	1922
1,250	7,085	160,929	7,609	8	131,023	.....	6,358	44,785	[K]	18	732,407	978,430	1.34	1923
1,440	6,811	173,538	7,486	10	134,522	[K]	5,920	39,498	[K]	13	713,940	1,022,683	1.43	1924
1,695	7,212	176,768	8,097	24	144 648	[K]	5,763	29,173	[K]	12	763,743	1,284,960	1.68	1925
1,956	7,272	179,195	8,961	43	166,916	[K]	5,946	25,776	[K]	8	770,874	1,447,760	1.88	1926
2,242	7,593	277,775	9,526	60	217,389	[K]	6,023	21,307	[K]	7	901,129	1,172,830	1.30	1927
2,603	7,015	249,857	9,956	46	257,320	[K]	5,661	21,461	[K]	6	901,474	1,054,880	1.17	1928
3,377	6,743	255,004	11,820	19	296,876	[K]	5,574	19,314	[K]	7	1,007,323	1,280,417	1.27	1929
3,647	6,486	216,486	12,803	21	290,457	[K]	5,071	17,868	[K]	7	898,011	1,070,200	1.19	1930
3,363	5,327	180,574	11,892	6	332,437	[K]	4,472	14,834	[K]	7	851,081	550,630	65	1931
3,508	4,644	153,244	12,412	5	312,478	[K]	3,876	13,418	[K]	16	785,159	680,460	.87	1932
3,181	4,235	182,251	12,624	5	402,609	[K]	3,815	11,227	[K]	30	905,656	608,000	.67	1933
3,804	4,234	180,107	14,478	10	381,516	[K]	4,095	12,556	.....	41	908,065	904,825	1.00	1934
4,236	4,082	185,288	15,810	[K]	392,666	[K]	3,902	13,755	.....	65	996,596	961,440	.96	1935
4,663	3,847	206,555	17,070	[K]	427,411	[K]	3,847	14,582	.....	63	1,099,687	1,199,820	1.09	1936
5,478	3,559	228,839	19,189	[K]	510,318	[K]	3,845	19,166	.....	77	1,279,160	1,513,340	1.18	1937
5,045	3,298	174,994	17,426	[K]	475,850	[K]	3,684	19,022	.....	82	1,214,355	1,373,060	1.13	1938
5,098	3,156	159,913	17,382	50	483,528	4	3,580	21,454	.....	.....	1,264,962	1,294,470	1.02	1939
4,999	3,159	156,164	17,353	24	493,209	3	3,444	25,711	.....	.....	1,353,214	1,385,440	1.02	1940
5,185	3,510	154,702	16,750	12	505,572	4	3,433	29,878	.....	.....	1,402,228	1,602,000	1.14	1941
5,421	3,543	140,690	17,779	9	483,097	.....	3,574	32,812	.....	.....	1,386,645	1,643,470	1.19	1942
5,001	3,277	122,740	15,641	12	592,884	5	3,338	33,413	.....	(Fla.) 2	1,501,905	1,802,286	1.20	....[P]1943
144,794	598,707	5,250,610	1,036,828	436	8,161,360	16	421,115	597,081	.....	574	28,097,196	$33,191,135	$1.18	....Total

[F] New York included with Pennsylvania.
[G] Tennessee included with Kentucky, 1876-1907, inclusive.
[H] Less than 500 barrels.
[I] Figures for Oklahoma and Kansas for years 1905-1906 shown together by *Mineral Resources;* here divided by aid of *Petroleum in the United States and Possessions*, by Arnold and Kemnitzer.
[J] Michigan shown with Missouri in 1900-1911.
[K] Included under "Unclassified."
[L] Kentucky and Tennessee figures in years 1916-18 obtained with aid of *Mineral Resources* and *Petroleum in the United States and Possessions*, by Arnold and Kemnitzer.
[M] Insignificant production of Utah (mostly used as fuel) shown with Wyoming.
[N] Little production but no record available.
[O] Figures on average price per barrel for years 1859-1875 taken from *Petroleum in the United States and Possessions*, by Arnold and Kemnitzer; remainder from *Mineral Resources* and *Minerals Yearbook*.
[P] Bureau of Mines figures for first 10 months; November and December estimated by THE OIL WEEKLY, with aid of weekly reports of American Petroleum Institute and other sources.

Rotary Rigs Up More Than Cable-Tool Rigs

Rotaries increase 7.8 percent against 4.1 percent for cable tools, and now account for 64.9 percent of rigs

INCREASED drilling has benefited both rotary and cable-tool rigs, more of each type being in operation on January 1, 1944, than a year ago. However, rotary rigs have shown the sharpest gain, and there were almost twice as many rotary rigs as cable tool the first of the current year, indicating the concentration of drilling in rotary territory.

At the beginning of this year, 64.9 percent of all rigs in operation were rotary and 35.1 percent were cable tool, representing a gain of 7.8 percent in rotary and 4.1 percent for cable tools. Last year on January 1, these percentages were 53 for rotary and 47 for cable tool.

The total number of rigs in operation in the United States the first of this year were materially greater than a year ago, totaling 3595 against 2797 last year.

The largest number of rigs were operating in Texas. This state had 955 of the country's total, of which 830, or 79.9 percent, were rotary. Oklahoma ranked second with 389 rigs, of which 323, or 83.7 percent, were rotary, and California was third with 359 rigs, of which 98.1 percent were rotary.

West Texas had the largest number of rigs of any sector in Texas, almost as many as second and third ranking Oklahoma and California. Against West Texas 359 rigs, North Texas had 148.

Leading cable-tool area is the Appalachian or Eastern region, which uses standard tools 100 percent. In this district, Pennsylvania had 250 rigs operating January 1, Ohio had 219, New York 116, and West Virginia 68. Michigan and Texas were the only states to have more than 100 cable-tool rigs running.

Certain districts in Texas use combination methods, rotary to the casing point and cable tools into the producing formation. Michigan also depends on combination drilling for some of its operations.

Rotary and Cable Tool Drilling in the United States, January 1, 1944

Table also embodies comparisons with operations January 1, 1943

STATE	DRILLING			RIGS UP			SHUT DOWN			ALL RIGS IN USE (DRILLING, RIGS UP AND SHUT DOWN)						
										ROTARY				CABLE TOOL		
	Rotary	Cable Tool	Total	Rotary	Cable Tool	Total	Rotary	Cable Tool	Total	TOTAL (Rotary and Cable Tool)	Number	Percent of Total	Percent of all Active Rigs Accounted for by Rotary Outfits 1 Year Ago (January 1, 1943)	Number	Percent of Total	Percent of al Active Rigs Accounted for by Cable Tool Outfits 1 Year Ago (January 1, 1943)
Alabama	4	....	4	....	....	....	....	....	....	4	4	100.0	....	....	....	....
Arizona	1	2	3	....	....	....	....	3	....	6	1	16.7	....	5	83.3	....
Arkansas	32	....	32	3	....	3	1	....	1	36	36	100.0	91.3	....	....	8.7
California	277	4	281	58	1	59	17	2	19	359	352	98.1	93.7	7	1.9	6.3
Colorado	5	7	12	1	....	1	1	6	7	20	7	35.0	22.2	13	65.0	77.8
Florida	1	....	1	2	....	2	1	....	1	4	4	100.0	100.0	....	....	....
Georgia	1	....	1	....	....	....	....	....	....	1	1	100.0	100.0	....	....	....
Illinois	133	15	148	27	3	30	30	3	33	211	190	90.0	84.0	21	10.0	16.0
Indiana	29	3	32	6	1	7	8	1	9	48	43	89.6	49.1	5	10.4	50.9
Iowa	....	....	....	....	....	....	....	2	2	2	....	....	....	2	100.0	100.0
Kansas	170	44	214	35	6	41	28	4	32	287	233	81.2	76.8	54	18.8	23.2
Kentucky	57	6	63	6	1	7	4	....	4	74	67	90.5	33.3	7	9.5	66.7
Louisiana	97	....	97	12	....	12	20	....	20	129	129	100.0	100.0	....	....	....
North Louisiana	32	....	32	7	....	7	13	....	13	52	52	100.0	100.0	....	....	....
South Louisiana	65	....	65	5	....	5	7	....	7	77	77	100.0	100.0	....	....	....
Michigan	12	65	77	4	15	19	1	23	24	120	17	14.2	11.6	103	85.8	88.4
Mississippi	12	1	13	3	....	3	5	....	5	21	20	95.2	100.0	1	4.8	....
Missouri	1	5	6	....	....	....	....	....	....	6	1	16.7	11.1	5	83.3	88.9
Montana	....	50	50	1	16	17	2	14	16	83	3	3.6	13.3	80	96.4	86.7
Nebraska	3	2	5	....	....	....	2	1	3	8	5	62.5	59.1	3	37.5	40.9
New Mexico	13	*71	84	1	*6	7	2	*18	20	111	16	14.4	15.2	95	85.6	84.8
New York	....	81	81	....	15	15	....	20	20	116	....	....	....	116	100.0	100.0
North Dakota	1	....	1	....	....	....	....	....	....	1	1	100.0	50.0	....	....	50.0
Ohio	....	158	158	....	22	22	....	39	39	219	....	....	....	219	100.0	100.0
Oklahoma	278	49	327	43	12	55	2	2	4	386	323	83.7	77.5	63	16.3	22.5
Oregon	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	100.0
Pennsylvania	....	180	180	....	27	27	....	43	43	250	....	....	....	250	100.0	100.0
South Dakota	1	1	2	....	....	....	....	1	1	3	1	33.3	50.0	2	66.7	50.0
Tennessee	....	3	3	....	2	2	....	1	1	6	....	....	....	6	100.0	100.0
Texas	689	98	787	43	3	46	98	24	122	955	830	86.9	79.9	125	13.1	20.1
E. Tex. Border Co.'s	7	....	7	1	....	1	1	....	1	9	9	100.0	100.0	....	....	....
East Texas Field	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Rest of East Texas	48	....	48	7	....	7	13	....	13	68	68	100.0	100.0	....	....	....
North Texas	107	*9	116	5	....	5	26	*1	27	148	138	93.2	85.6	10	6.8	14.4
West Central Texas	17	*37	54	....	*1	1	1	*10	11	66	18	27.3	21.3	48	72.7	78.7
West Texas	270	*50	320	8	*2	10	15	*11	26	356	293	82.3	73.5	63	17.7	26.5
Texas Panhandle	†35	....	35	†8	....	8	†13	....	13	56	56	100.0	93.6	....	....	6.4
Gulf Coast, Upper	79	....	79	6	....	6	9	....	9	94	94	100.0	100.0	....	....	....
Gulf Coast, Lower	90	....	90	6	....	6	13	....	13	109	109	100.0	100.0	....	....	....
Southwest Texas	30	1	31	1	....	1	4	1	5	37	35	94.6	100.0	2	5.4	....
South Central Texas	6	1	7	1	....	1	3	1	4	12	10	83.3	84.6	2	16.7	30.5
Utah	1	2	3	....	....	....	....	1	1	4	1	25.0	20.0	3	75.0	100.0
West Virginia	....	49	49	....	7	7	....	12	12	68	....	....	2.0	68	100.0	100.0
Wyoming	41	5	46	6	....	6	1	4	5	57	48	84.2	51.0	9	15.8	53.0
Total United States	1,859	901	2,760	251	137	388	223	224	447	3,595	2,333	64.9	53.0	1,262	35.1	47.0

* Cable tool data include spudders and machines. † Combination rotary and cable tool. General practice is to spud with machine, then use rotary to top of oil pay, else stop in upper gas, say 2500-2800 foot level, or 500 to 300 feet above completion depth, then use cable tools to finish out the hole.

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The Petroleum Industry has met its wartime responsibilities like a good soldier and a true patriot, without counting the cost in operating expense and dwindling reserves. It will face other serious problems in the postwar period.

But while the war lasts, and in the period of readjustment which will follow the peace, this bank will serve the Petroleum Industry in the further advancement and development of oil.

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Well Completions Drop Ten Percent to Ten Year Low

Handicapped by wartime conditions, the industry completes fewest wells since the depression; but an urgent need for enlarged producing ability is expected to result in the completion of a greater number during 1944

A DECLINE of 10.5 percent in the number of wells completed in the United States during 1943 as compared with 1942, reflects a year of drilling under the most stringent conditions yet experienced by the oil industry. Shortages of manpower and materials with conservation restrictions plus a below-parity price for crude oil, all combined to handicap operations, resulting in a total of only 19,212 wells completed last year. For 1942 the total stood at 21,454.

The outlook for completing a more normal number of wells during 1944 is bright, as indicated by a survey of drilling plans that is published elsewhere in this issue. The necessity of drilling a larger number of wells, if the industry is to be able to produce sufficient oil to satisfy requirements, is being recognized, and enough materials for a very substantial increase may be provided.

The 1943 total is the first in 10 years that has dropped below 20,000 wells completed. In 1933, a depression year, the net result of operations was 13,145 wells. Then followed a period when year by year the trend was upward until 1941 showed 32,210 wells drilled. Since then operations have been on a greatly curtailed, wartime basis, with consequent regression in the number of wells finished.

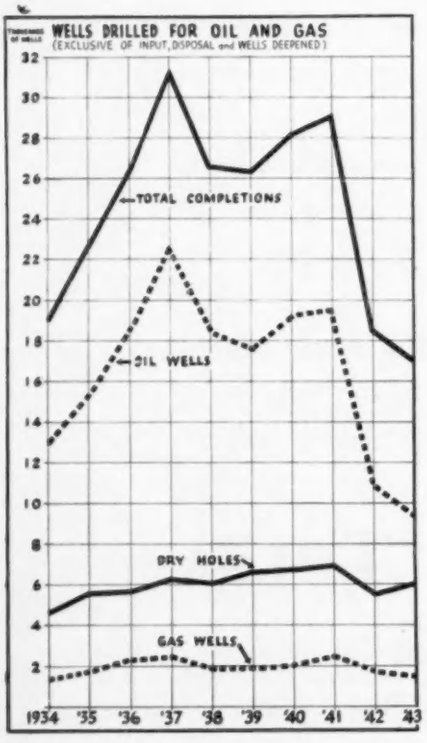
More Dry Holes

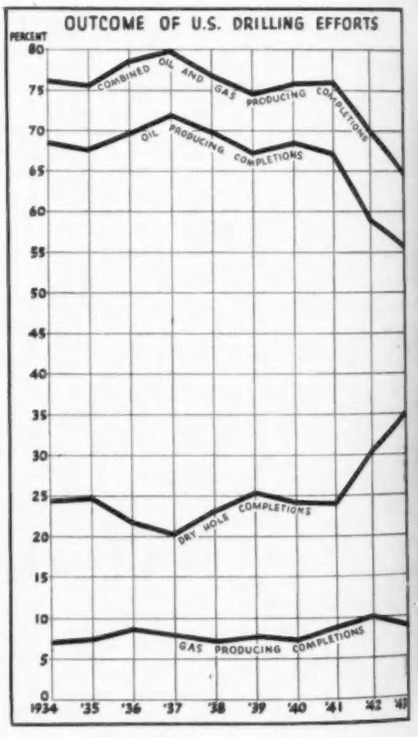
An increase of 4.3 percent in the number of dry holes completed during 1943 as compared with 1942, emphasizes the extent to which wildcatting affected total operations. Out of the 19,212 completions, 5928 were dry holes, representing 35.7 percent of the total. This trend of diminishing effectiveness from drilling is no doubt due to the larger percentage of wildcats among total completions, and partially by government wide-spacing regulations that occasioned some stepping out of producing boundaries.

Completed wells producing oil, gas or distillate totaled 11,149 for 1943, a decrease of 13.7 percent as compared with 1942. Here again, the decline in the percent of productive discoveries is greater in proportion than the decline in the rate of drilling. By products obtained, completions were as follows: oil, 9,528; gas, 1,545; distillate, 76.

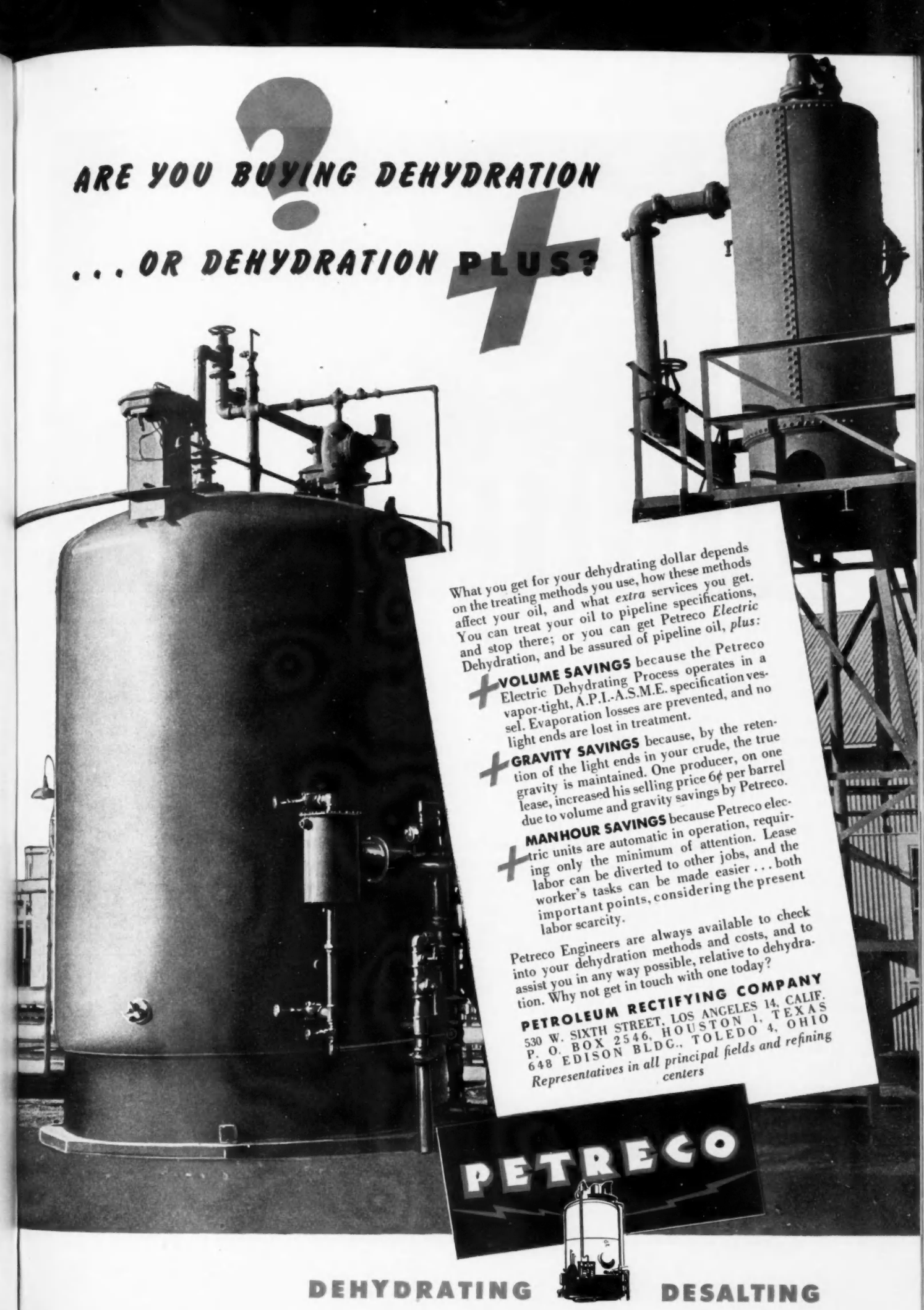
Deepening operations declined 27.4 percent during 1943, as compared with the previous year, with the total number of old wells deepened at 427. In 1942 the total was 588. A few areas showed gains in this type of work, including California, Texas, New Mexico and Michigan, with New Mexico and Texas leading. In West Central Texas, for instance, the gain over 1942 was 108.3 percent. New Mexico gained 85.7 percent, California 83 percent, and Michigan 80 percent. All other states showed fewer wells deepened, resulting in the over-all decline as compared with 1942.

Miscellaneous wells drilled totaled 1708, distributed as follows: Water-input wells, 1576, gas-input wells, 91; and salt-water-disposal wells, 41. By far the greatest number of the water-input


WELLS DRILLED FOR OIL AND GAS
(EXCLUSIVE OF INPUT, DISPOSAL and WELLS DEEPENED)
TOTAL COMPLETIONS
OIL WELLS
DRY HOLES
GAS WELLS
1934 '35 '36 '37 '38 '39 '40 '41 '42 '43


OUTCOME OF U.S. DRILLING EFFORTS
PERCENT
COMBINED OIL AND GAS PRODUCING COMPLETIONS
OIL PRODUCING COMPLETIONS
DRY HOLE COMPLETIONS
GAS PRODUCING COMPLETIONS
1934 '35 '36 '37 '38 '39 '40 '41 '42

Breakdown of wells completed in 1942 and 1943 by states on page 122.



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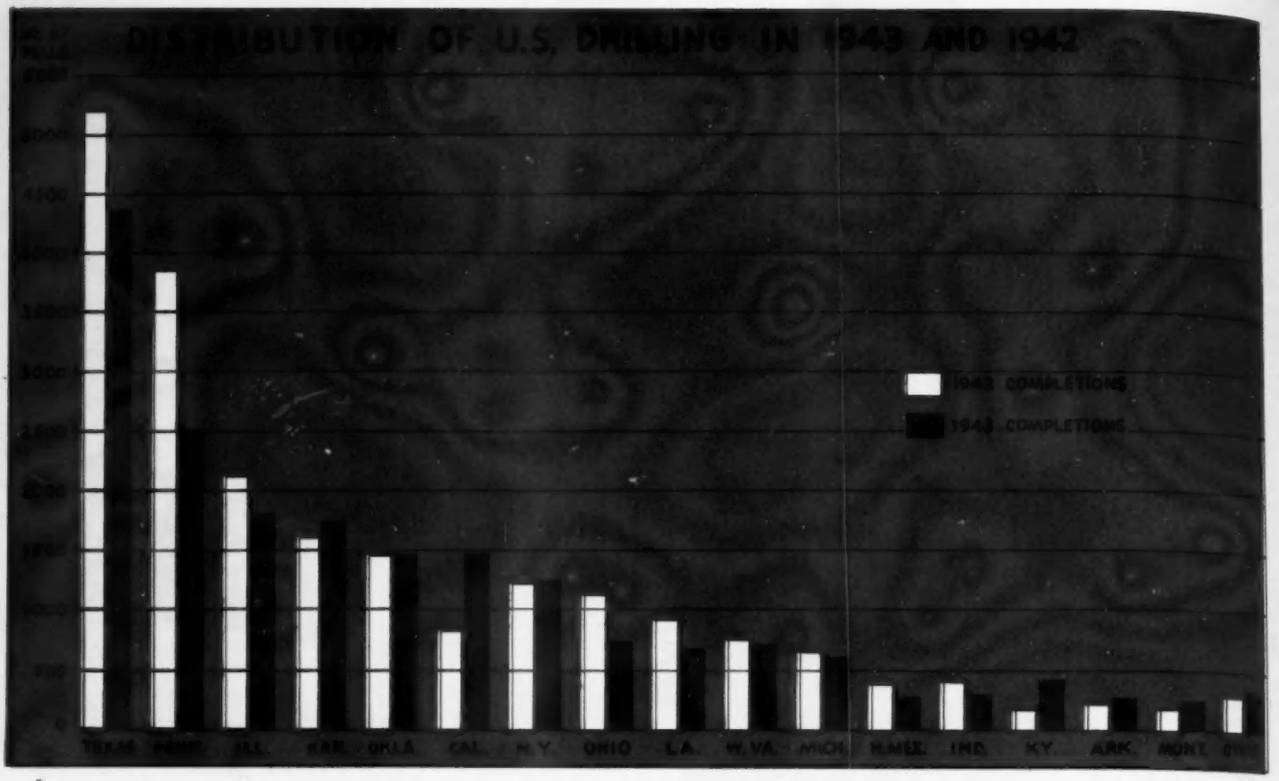


wells were drilled in Pennsylvania where water drive is extensively used to produce the oil. In that state 1104 water-input wells were completed. As compared with 1942, the number of wells drilled in Pennsylvania represents a drop of 516, indicating to what extent secondary operations have suffered along with other types of recovery.

Salt-water-disposal wells were drilled in Arkansas, Illinois, Kansas, Kentucky, Oklahoma and Texas, with Kansas showing 13 such wells, Illinois 10, Texas 9, Arkansas 2, and Kentucky 1. Re-injection of salt water into the formations to maintain bottom-hole pressure is a major project in the East Texas field, and 4 of the 9 wells drilled in Texas were in the East Texas area.

Gas-input wells gained over 1942, by 12. Oklahoma led with a total of 60. Illinois was next with 12, and Texas was third with 11. Most of these wells were drilled in old shallow fields, where gas-lift is used as the principal method of secondary recovery.

Texas led all states in completions, although its operations were down 15.9 percent from 1942. A total of 4370 tests were completed in this state. Illinois had the second largest volume, with 1822.

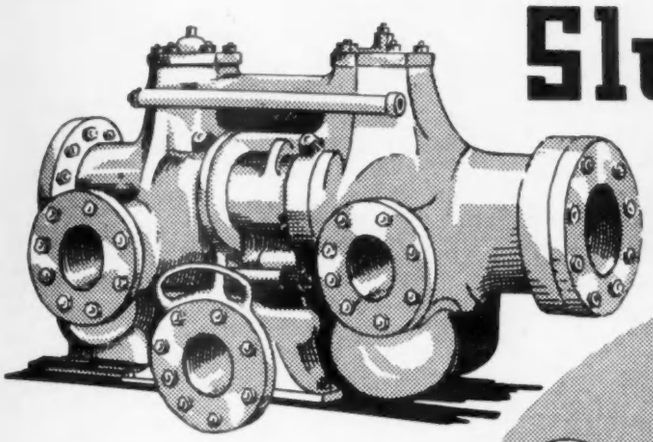
The largest gain in completions occurred in California, which state completed 1477 wells against 826 in 1942, a gain of 78.8 percent.

Wells Drilled for Oil and Gas in the United States—1859-1943

Cumulative totals—1859-1922, Bureau of Mines; 1923-1943, weekly reports by The Oil Weekly

YEAR	NEW WELLS										Old Wells Drilled Deeper	Total Completions
	FOR OIL OR GAS						OTHER NEW WELLS					
	Oil	Gas	Distillate	Total Productive Wells	Dry Holes	Total New For Oil or Gas	Water Input	Gas Input	Salt Water Disposal	Total New Wells		
1859-1922	[1]481,863	[1]14,542	.....	496,405	118,948	615,353	.....	.....	.....	615,353	.....	615,353
1923	13,407	1,892	.....	15,299	5,214	20,513	.....	.....	.....	20,513	.....	20,513
1924	14,311	2,250	.....	16,561	5,152	21,713	.....	.....	.....	21,713	.....	21,713
1925	16,162	2,644	.....	18,806	6,600	25,406	.....	.....	.....	25,406	.....	25,406
1926	17,787	2,848	.....	20,635	8,360	28,995	.....	.....	.....	28,995	.....	28,995
1927	13,396	2,586	.....	15,982	6,319	22,301	.....	.....	.....	22,301	.....	22,301
1928	10,982	2,733	.....	13,715	6,249	19,964	.....	.....	.....	19,964	.....	19,964
1929	13,125	3,109	.....	16,234	7,229	23,463	.....	.....	.....	23,463	.....	23,463
1930	10,745	3,006	.....	13,751	6,097	19,848	.....	.....	.....	19,848	.....	19,848
1931	6,618	2,090	.....	8,708	3,008	11,716	.....	.....	.....	11,716	.....	11,716
1932	10,151	1,012	.....	11,163	3,127	14,290	.....	.....	.....	14,290	.....	14,290
1933	7,828	994	.....	8,822	3,369	12,191	954	.....	.....	13,145	.....	13,145
1934	13,066	1,353	.....	14,419	4,678	19,097	1,696	.....	.....	20,793	.....	20,793
1935	15,301	1,719	.....	17,020	5,588	22,608	1,665	.....	.....	24,273	.....	24,273
1936	18,432	2,323	.....	20,755	5,695	26,450	2,096	.....	.....	28,546	.....	28,546
1937	22,481	2,500	.....	24,981	6,370	31,351	2,594	.....	.....	33,945	.....	33,945
1938	18,544	1,913	.....	20,457	6,133	26,590	1,470	.....	.....	28,060	.....	28,060
1939	17,687	1,943	.....	19,630	6,670	26,300	1,358	.....	.....	27,658	.....	27,658
1940	19,225	2,023	.....	21,248	6,770	28,018	1,988	.....	.....	30,006	650	30,656
1941	19,472	2,582	.....	22,054	6,984	29,038	2,185	117	47	31,387	823	32,210
1942	10,942	1,875	105	12,922	5,684	18,606	2,141	72	47	20,866	588	21,454
1943	9,528	1,545	76	11,149	5,928	17,077	1,576	91	41	18,785	427	19,212
Total	781,053	[2]59,482	181	840,716	240,172	1,080,888	19,723	280	135	1,101,026	2,488	1,103,514

[1] Gas wells during the period prior to 1916 were included with oil wells. [2] Includes only gas wells completed since 1916. [3] Includes gas wells completed prior to 1916.



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Wells Completed by the Petroleum Industry in the United States in 1942 and 1943

(THIS TABLE CONTINUED BELOW)

STATE OR DISTRICT	NEW WELLS DRILLED FOR OIL OR GAS																					
	PRODUCTIVE (In Fields, Outposts, and Wildcats)									DRY HOLES										Total New For Oil or Gas		
	Oil		Gas		Distillate		Total Productive			In Fields		Outposts		Wildcats		Total Dry						
	1942	1943	1942	1943	1942	1943	1942	1943	Percent Change	1942	1943	1942	1943	1942	1943	1942	1943	Percent Change	1942	1943	Percent Change
Alabama														3	2	3	2	— 33.3	3	2	— 33.3
Arizona														3	5	3	5	+ 66.6	3	5	+ 66.6
Arkansas	103	156		1	45	2	148	159	+ 7.4	63	37			18	60	81	97	+ 19.7	229	256	+ 11.8
California	557	1,153	8	29			565	1,182	+109.2	127	105			116	157	243	262	+ 7.8	808	1,444	+ 78.7
Colorado	6	12	1	2			7	14	+100.0	5	11			3	9	8	20	+146.3	15	34	+
Florida		1						1	+					1	4	1	4	+400.0	1	5	+500.0
Georgia														2	4	2	4	+100.0	2	4	+100.0
Illinois	1,177	1,030	15	11			1,192	1,041	— 12.7	355	332			472	378	827	710	— 14.1	2,019	1,751	— 13.3
Indiana	129	112	24	21			153	133	— 13.1	141	83			74	84	215	167	— 22.3	368	300	— 18.5
Iowa															3		3	+		3	+
Kansas	846	868	82	34			928	902	— 2.2	300	384		5	316	403	616	792	+ 28.6	1,544	1,694	+ 9.7
Kentucky	69	198	2	5			71	203	+185.9	91	101				118	91	219	+140.6	162	422	+160.5
Louisiana	585	357	40	46	11	34	636	437	— 31.3	169	117		1	108	112	277	230	— 16.9	913	667	— 26.9
North Louisiana	272	145	26	37	4	23	302	205	— 32.1	59	20			67	94	126	114	— 9.5	428	319	— 25.5
South Louisiana	313	212	14	9	7	11	334	232	— 30.5	110	97		1	41	18	151	116	— 23.1	485	348	— 28.2
Michigan	308	223	76	50			384	273	— 28.9	120	118		8	161	196	281	322	+ 14.6	665	595	— 10.5
Mississippi	35	34					35	34	— 2.9	24	2			41	51	65	53	— 18.5	100	87	— 13.0
Missouri	4	2	2	6			6	8	+ 33.3	10	3			18	18	28	21	— 25.0	34	29	— 14.7
Montana	126	142	46	42			172	184	+ 7.0	18	38			3	20	21	58	+176.2	193	242	+ 25.4
Nebraska	12	6					12	6	— 50.0	2	2			13	31	15	33	+120.0	27	39	+ 44.4
New Mexico	261	179	12	6			273	185	— 32.2	62	25			42	48	104	73	— 29.8	377	258	— 31.6
New York	711	781	6	7			717	788	+ 9.9	9	11					9	11	+ 22.2	726	799	+ 10.0
Ohio	235	152	510	316			745	468	— 37.2	359	256					359	256	— 28.9	1,104	724	— 34.4
Oklahoma	625	569	95	105		2	720	676	— 6.1	319	352		1	234	263	553	616	+ 11.4	1,273	1,292	+ 1.5
Pennsylvania	1,802	1,122	285	232			2,087	1,354	— 35.1	111	61					111	61	— 45.0	2,198	1,415	— 35.6
Tennessee			2	2			2	2		2	3			5	1	7	4	— 42.8	9	6	— 33.3
Texas	3,155	2,250	170	130	49	38	3,374	2,418	— 28.3	754	795		21	898	945	1,652	1,761	+ 6.6	5,026	4,179	— 16.
East Texas Border Co.'s.		13						13	+					2	5	2	5	+150.0	2	18	+900.0
East Texas Field	10						10		—100.0	6						6		—100.0	16		—100.0
Rest of East Texas	231	116	15	3	7	10	253	129	— 49.0	45	34		1	90	88	135	123	— 8.9	388	252	— 35.0
North Texas	396	475	5	2	1		402	477	+ 18.6	235	321		3	189	230	424	554	+ 30.7	826	1,031	+ 24.8
West Central Texas	144	112	24	20			168	132	— 21.4	97	119		2	114	115	211	236	+ 11.8	379	368	— 2.9
West Texas	1,122	739	13	7			1,135	746	— 34.2	85	77		1	113	79	198	157	— 20.7	1,333	903	— 30.2
Texas Panhandle	277	137	63	30			340	167	— 50.8	17	24			3	4	20	28	+ 40.0	360	195	— 45.8
Gulf Coast, Upper	265	161	17	7	7	4	289	172	— 40.4	66	67		1	88	96	154	164	+ 6.5	443	336	— 24.1
Gulf Coast, Lower	504	343	25	43	31	22	562	408	— 27.4	96	73		7	113	150	209	230	+ 10.0	771	638	— 17.2
Southwest Texas	174	144	7	18	1	2	182	164	— 9.9	88	77		6	128	124	216	207	— 4.2	398	371	— 6.8
South Central Texas	32	10	1				33	10	— 69.6	19	3			58	54	77	57	— 26.0	110	67	— 39.1
West Virginia	118	81	494	495			612	576	— 5.9	98	123			1		99	123	+ 24.2	711	699	— 1.7
Wyoming	78	100	5	5			83	105	+ 26.5	13	13	•			8	13	21	+ 61.6	96	126	+ 31.2
Total United States	10,942	9,528	1,875	1,545	105	76	12,922	11,149	— 13.7	3,152	2,972		36	2,532	2,920	5,684	5,928	+ 4.3	18,606	17,077	— 8.2

Wells Completed by the Petroleum Industry in the United States in 1942 and 1943

(CONTINUED FROM ABOVE)

STATE OR DISTRICT	OTHER NEW WELLS						TOTAL NEW WELLS			OLD WELLS DRILLED DEEPER									TOTAL ALL WELLS		
	Water Input		Gas Input		Salt Water Disposal					Oil		Gas		Dry		Total					
	1942	1943	1942	1943	1942	1943	1942	1943	Percent Change	1942	1943	1942	1943	1942	1943	1942	1943	Percent Change	1942	1943	Percent Change
Alabama							3	2	— 33.3										3	2	— 33.3
Arizona							3	5	+ 66.7										3	5	+ 66.7
Arkansas						2	229	258	+127.0	1	1					1	1		230	259	+ 12.6
California							808	1,444	+ 78.7	17	33			1		18	33	+ 83.3	826	1,477	+ 78.8
Colorado							15	34	+126.7										15	34	+126.7
Florida							1	5	+400.0										1	5	+400.0
Georgia							2	4	+100.0										2	4	+100.0
Illinois			16	12	18	10	2,053	1,773	— 13.6	71	33			20	6	91	39	— 57.1	2,144	1,812	— 15.5
Indiana							368	300	— 18.5	13		4		10	5	27	5	— 81.5	395	305	— 22.8
Iowa								3	+											3	+
Kansas		2	1	5	11	13	1,556	1,714	— 10.2	43	19	1	2	18	13	62	34	— 45.2	1,618	1,748	+ 8.0
Kentucky			1	2		1	163	425	+160.7	3				2	2	5	2	— 60.0	168	427	+154.2
Louisiana							913	667	— 26.9										913	667	— 26.9
North Louisiana							428	319	— 25.5										428	319	— 25.5
South Louisiana							485	348	— 28.2										485	348	— 28.2
Michigan							665	595	— 10.5		3			1	6	1	9	+800.0	666	604	— 9.3
Mississippi					1		101	87	— 13.9										101	87	— 13.9
Missouri							34	29	— 14.7										34	29	— 14.7
Montana							193	242	+ 25.4										193	242	+ 25.4
Nebraska							27	39	+ 44.4	1						1		—100.0	28	39	+ 39.3
New Mexico							377	258	— 31.6	7	11		2			7	13	+ 85.7	384	271	— 29.4
New York	502	442					1,228	1,241	+ 1.1										1,228	1,241	+ 1.1
Ohio			7	1			1,111	725	— 34.7	6	1	13	6	4	5	23	12	— 47.8	1,134	737	— 35.0
Oklahoma	2		19	60	12	6	1,306	1,358	+ 4.0	100	69	11	14	37	25	148	108	— 27.0	1,454	1,466	+ .82
Pennsylvania	1,620	1,104					3,818	2,519	— 34.0	2		19	8	6	2	27	10	— 63.0	3,845	2,529	— 34.2
Tennessee							9	6	— 33.3										9	6	— 33.3
Texas	17	28	27	11	5	9	5,075	4,227	— 16.7	87	113	6	3	30	27	123	143	+ 16.3	5,198	4,370	— 15.9
East Texas Border Co.'s.							2	18	+800.0										2	18	+800.0
East Texas Field		1			1	4	17	5	— 70.6										17	5	— 70.6
Rest of East Texas	2	1			2	1	392	254	— 35.2			1		4	1	5	1	— 80.0	397	255	— 35.8
North Texas	14	26	24	9	1	4	865	1,070	+ 23.7	29	26	1	1	15	11	45	38	— 15.5	910	1,108	+ 21.8
West Central Texas	1			1	1		381	369	— 3.1	8	18	2	2	2	5	12	25	+108.3	393	394	+ .25
West Texas							1,333	903	— 32.3	40	61			7	7	47	68	+ 23.4	1,380	971	— 29.6
Texas Panhandle							360	195	— 45.8	6	6			1	1	7	7	+	367	202	— 45.0
Gulf Coast, Upper			1				444	336	— 24.3		1						1		444	337	— 24.1
Gulf Coast, Lower			1	1			772	639	— 17.2	4	1	1			1	5	2	— 60.0	777	641	— 17.5
Southwest Texas			1				399	371	— 7.0			1		1	1	2	1	— 50.0	401	372	— 7.2
South Central Texas							110	67	— 39.1										110	67	— 39.1
West Virginia							711	699	— 1.7	4	1	44	14	5	3	53	18	— 66.0	764	717	— 6.2
Wyoming			1				97	126	+ 29.9	1						1			98	126	+ 28.6
Total United States	2,141	1,576	72	91	47	41	20,866	18,785	— 10.0	356	284	98	49	134	94	588	427	— 27.4	21,454	19,212	— 10.5

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A.P.I. THREAD DIMENSION, TAPER & FORM *(Conforms with A.P.I. Specifications throughout)	YES	YES	YES	YES	NO	NO	NO	NO
INTER-CHANGEABLE WITH A. P. I. *(Available in internal upset, external upset, internal flush; right and left hand threads.)	YES	YES	YES	NO	NO	NO	NO	NO
COUNTERBORE "LANDED" OR WELDED TO SUPPORT LAST ENGAGED THREAD *("Landed" tool joint removable by simple "breaking" of threaded make-up.)	YES	NO	YES	YES	NO	None	None	None
GRIPPING POWER OF SUPPORT INCREASES WITH JOINT MAKE-UP *(Design permits full make-up with normal thread dimension tolerances.)	YES	NO	NO	NO	NO	None	None	None
TOOL JOINT OF REGULAR TOOL JOINT STEEL	YES	YES	YES	YES	YES	YES	YES	NO
TOOL JOINTS REPLACEABLE IN FIELD SHOPS	YES	YES	Usually	YES	YES	YES	NO	NO
SIDE WALL WEAR TAKEN BY TOOL JOINT	YES	YES	YES	YES	YES	Partly	Partly	Partly

Information upon request.

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Deeper Holes Drilled During Year But Footage Is 10 Percent Off

Average completion depth for 1943 is 16 feet greater than in previous year, but six million less feet are drilled; Texas leads in footage, Louisiana in depth

A TOTAL of 58,664,779 feet of hole was drilled in completing the 19,212 wells finished during 1943. This represented a 10-percent decline from the 65,179,338 feet drilled during 1942, and in keeping with the volume of drilling was the smallest amount in 10 years.

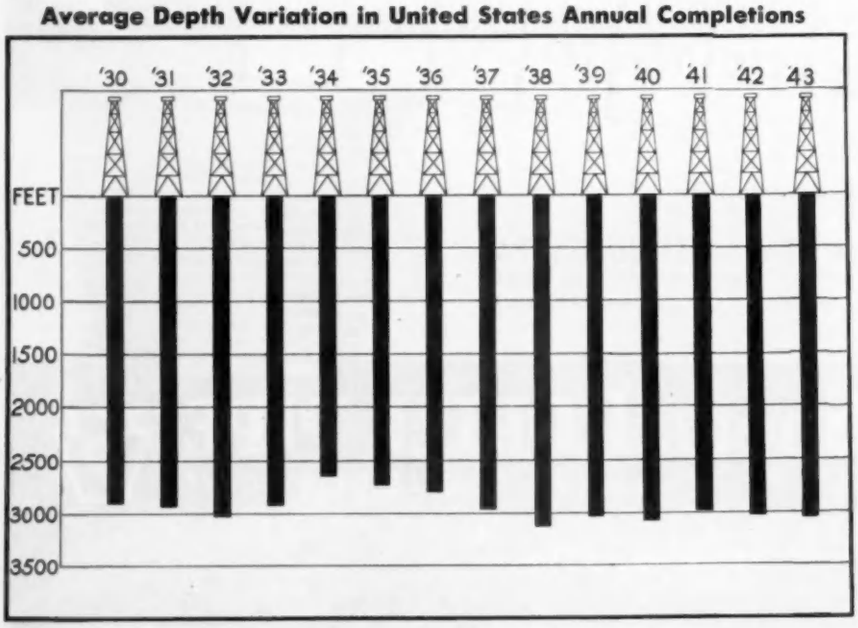
The decline in footage drilled, however, was slightly less than the decrease of 10.5 percent in number of completions, and therefore the average depth of all wells completed in 1943 was a little deeper than in the preceding year. The average depth of 1943 completions was 3054 feet, in contrast with 3038 feet in 1942.

The slightly greater average depth reflected the shifting of operations from the less deep areas to regions with relatively greater producing depths. For example, the Appalachian area, which consistently has the shallowest depths, did considerably less drilling in 1943 than in 1942. The leading state in this area, Pennsylvania, drilled 34.2 percent fewer wells and 32.3 percent less footage in 1943 than in 1942.

Average Drilling Depths

YEAR	Wells Completed	Footage Drilled	Average Depth per Well
1925	25,406	73,677,400	2900
1926	28,995	81,186,000	2800
1927	22,301	66,903,000	3000
1928	19,964	59,892,000	3000
1929	23,463	67,925,285	2895
1930	19,848	57,557,200	2900
1931	11,716	34,259,110	2924
1932	14,290	43,033,422	3011
1933	13,145	38,464,500	2926
1934	20,793	55,103,538	2650
1935	24,273	66,632,035	2745
1936	28,546	80,068,851	2805
1937	33,945	101,105,230	2979
1938	28,060	87,841,493	3131
1939	27,658	84,114,990	3037
1940	30,656	93,971,162	3065
1941	32,210	95,452,534	2963
1942	21,454	65,179,338	3038
1943	19,212	58,664,779	3054

Average Depth Variation in United States Annual Completions



Texas, the area with the greatest number of completions, again led in total footage drilled. It accounted for 17,176,176 feet of hole, or 31 percent of the national total. The state had an average depth of 4159 feet per well in 1943, against 4142 in 1942. The West Texas region accounted for the largest amount of Texas drilling, with the Lower Gulf Coast ranking second. Total footage drilled in the state, however, was 15.6 percent under its 1942 volume.

Footage and Average Depths Drilled in United States in 1943 and 1942 by states appear on page 126.

Kansas ranked second to Texas in amount of footage, its 1748 completions averaging 3302 feet for a total volume of 5,772,016 feet of hole. The average depth of wells was 16.1 percent greater than in 1942.

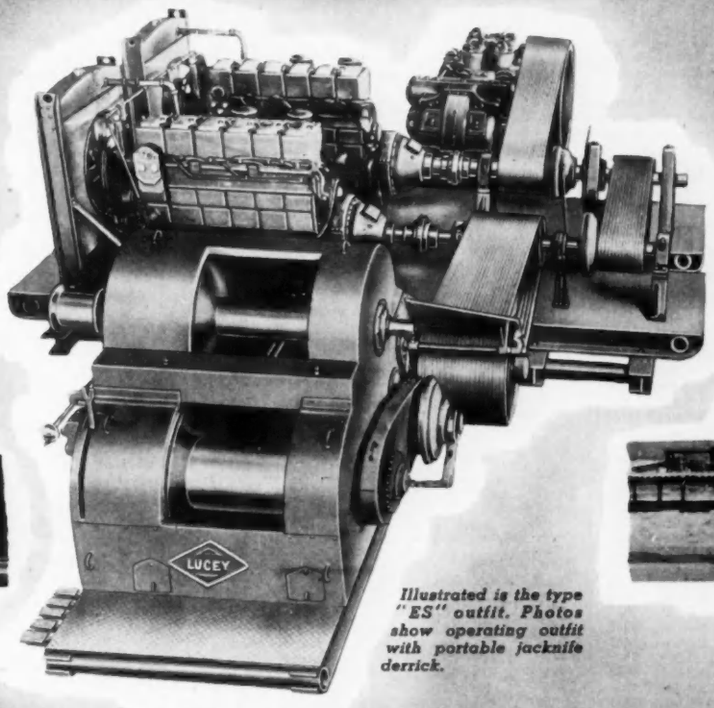
California Footage Up

Among the larger states, California showed the greatest increase in footage drilled, with a gain of 31.4 percent. This state, which drilled 78.8 percent more wells than in 1942, drilled 4,609,932 feet of hole.

Louisiana again had the greatest average depth per well, averaging 6675 feet. The great depth of wells in the state is due to South Louisiana which area had an average depth of 8976 feet per completion.

A total of 2,669,620 feet of hole was accounted by wells other than those drilled strictly for oil and gas, namely, water input, gas input and salt water disposal wells. Water-input wells, mainly in Pennsylvania and New York, accounted for 2,381,730 feet of hole, which compared with 3,251,122 feet drilled for this purpose in 1942.

LUCEY SLIM-HOLE DRILLING OUTFITS



Illustrated is the type "ES" outfit. Photos show operating outfit with portable jacknife derrick.

LUCEY SLIM-HOLE Drilling Outfits are built in 3 sizes and capacities:

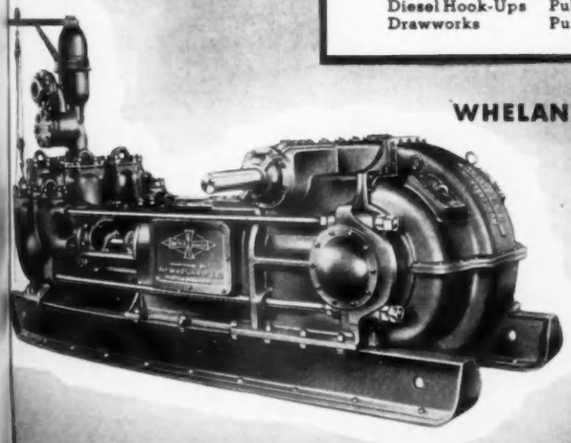
TYPE "B" . . 2,500 ft. TYPE "C" . . 5,000 ft.
TYPE "E" . . 7,500 ft.

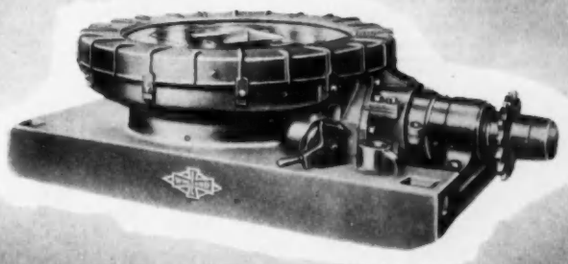
"S" indicates Sand Reel is built in as part of Drawworks unit. (Example: Type "ES")

OIL WELL LUCEY SUPPLIES

Boilers	Drift Recorders	Pumps, Steam	Tanks, Steel
Boiler Casings	Drill Pipe	Rectorheads	Tongs
Burners	Drilling Lines	Rectorseal	Tool Joints
Cable Tools	Elevators	Rock Bits	Totco Instruments
Casing	Engines	Rotaries	Trailers
Casing Lines	Fishing Tools	Sand Lines	Traveling Blocks
Chains	Line Pipe	Separators	Tubes, Boiler
Crown Blocks	Pipe Cleaners	Slim Hole Outfits	Tubing
Derricks	Portable Outfits	Sucker Rods	Turbo Generators
Diesel Hook-Ups	Pull Rods	Swabs	Valves
Drawworks	Pumps, Power	Swivels	Wire Rope

WHELAND-LUCEY drilling equipment





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Footage and Average Depths Drilled in the United States in 1942 and 1943

(THIS TABLE CONTINUED BELOW)

State or District	NEW WELLS OF 1943																	
	DRILLED FOR OIL OR GAS									Water Input			Gas Input			Salt Water Disposal		
	In Fields (Including Discovery Wells of New Fields, New Pays and Extensions)			Outpost Tests, Unproductive			Wildcats, Unproductive											
	Wells	Footage	Average Depth	Wells	Footage	Average Depth	Wells	Footage	Average Depth	Wells	Footage	Average Depth	Wells	Footage	Average Depth	Wells	Footage	Average Depth
Alabama	.....	.....	....	..	.....	....	2	11,127	5564	....	.....	....	..	.....	....	..	.....	....
Arizona	.....	.....	....	..	.....	....	5	14,498	2900	....	.....	....	..	.....	....	..	.....	....
Arkansas	196	925,906	4724	..	.....	....	60	275,757	4596	....	.....	....	..	.....	....	2	11,229	5615
California	1,287	3,929,320	3053	..	.....	....	157	654,219	4167	....	.....	....	..	.....	....	..	.....	....
Colorado	25	62,690	2508	..	.....	....	9	29,491	3277	....	.....	....	..	.....	....	..	.....	....
Florida	1	11,616	11616	..	.....	....	4	11,217	2804	....	.....	....	..	.....	....	..	.....	....
Georgia	.....	.....	....	..	.....	....	4	13,660	3415	....	.....	....	..	.....	....	..	.....	....
Illinois	1,373	3,527,853	2569	..	.....	....	378	926,240	2450	....	.....	....	12	25,112	2093	10	22,883	2288
Indiana	216	398,184	1843	..	.....	....	84	153,109	1823	....	.....	....	..	.....	....	..	.....	....
Iowa	.....	.....	....	..	.....	....	3	4,874	1625	....	.....	....	..	.....	....	..	.....	....
Kansas	1,286	4,262,433	3314	5	17,846	3569	403	1,418,176	3519	2	7,333	3667	5	13,002	2600	13	43,578	3352
Kentucky	304	557,452	1834	..	.....	....	118	235,690	1997	....	.....	....	2	1,225	612	1	610	610
Louisiana	554	3,821,902	6899	1	10,383	10383	112	619,898	5535	....	.....	....	..	.....	....	..	.....	....
N. Louisiana	225	869,430	3864	..	.....	....	94	459,190	4885	....	.....	....	..	.....	....	..	.....	....
S. Louisiana	329	2,952,472	8974	1	10,383	10383	18	160,708	8928	....	.....	....	..	.....	....	..	.....	....
Michigan	391	1,000,355	2558	8	27,856	3482	196	513,336	2619	....	.....	....	..	.....	....	..	.....	....
Mississippi	36	180,230	5006	..	.....	....	51	293,987	5764	....	.....	....	..	.....	....	..	.....	....
Missouri	11	8,879	807	..	.....	....	18	15,425	857	....	.....	....	..	.....	....	..	.....	....
Montana	222	482,241	2172	..	.....	....	20	49,605	2480	....	.....	....	..	.....	....	..	.....	....
Nebraska	8	19,434	2429	..	.....	....	31	79,070	2548	....	.....	....	..	.....	....	..	.....	....
New Mexico	210	668,785	3185	..	.....	....	48	128,635	2680	....	.....	....	..	.....	....	..	.....	....
New York	799	1,123,299	1406	..	.....	....	...	.....	....	442	589,896	1335	..	.....	....	..	.....	....
Ohio	724	1,857,787	2566	..	.....	....	...	.....	....	....	.....	....	1	1,660	1660	..	.....	....
Oklahoma	1,028	3,294,215	3204	1	4,314	4314	263	1,038,204	3948	....	.....	....	60	107,885	1798	6	15,923	2654
Pennsylvania	1,415	2,581,906	1780	..	.....	....	...	.....	....	1,104	1,766,400	1600	..	.....	....	..	.....	....
Tennessee	5	4,945	989	..	.....	....	1	1,189	1189	....	.....	....	..	.....	....	..	.....	....
Texas	3,213	13,836,489	4315	21	100,906	4805	945	4,120,572	4360	28	18,101	646	11	21,812	1983	9	22,971	2552
E. Tex. Border Co.'s	13	79,876	6143	..	.....	....	5	34,418	6883	....	.....	....	..	.....	....	..	.....	....
East Texas Field	.....	.....	....	..	.....	....	...	.....	....	1	115	115	..	.....	....	4	11,835	2959
Rest of East Texas	163	932,640	5722	1	5,090	5090	88	450,959	5125	1	5,025	5025	..	.....	....	1	5,494	5494
North Texas	798	2,237,596	2804	3	15,549	5183	230	644,368	2802	26	12,961	499	9	10,807	1201	4	5,642	1410
West Central Texas	251	597,758	2382	2	4,089	2045	115	276,456	2404	....	.....	....	1	3,926	3926	..	.....	....
West Texas	823	3,659,010	4446	1	4,862	4862	79	378,767	4795	....	.....	....	..	.....	....	..	.....	....
Texas Panhandle	191	581,994	3047	..	.....	....	4	22,664	5666	....	.....	....	..	.....	....	..	.....	....
Gulf Coast, Upper	239	1,827,928	7648	1	7,500	7500	96	728,604	7590	....	.....	....	..	.....	....	..	.....	....
Gulf Coast, Lower	481	2,868,098	5963	7	40,670	5810	150	930,735	6205	....	.....	....	1	7,079	7079	..	.....	....
Southwest Texas	241	1,001,490	4156	6	23,146	3858	124	499,500	4028	....	.....	....	..	.....	....	..	.....	....
South Central Texas	13	50,063	3851	..	.....	....	54	154,101	2854	....	.....	....	..	.....	....	..	.....	....
West Virginia	699	1,931,171	2763	..	.....	....	...	.....	....	....	.....	....	..	.....	....	..	.....	....
Wyoming	118	509,415	4317	..	.....	....	8	26,321	3290	....	.....	....	..	.....	....	..	.....	....
Total United States	14,121	44,996,471	3186	36	161,305	4481	2,920	10,634,300	3642	1,576	2,381,730	1511	91	170,696	1876	41	117,194	2858

Footage and Average Depths Drilled in the United States in 1942 and 1943

(CONTINUED FROM ABOVE)

STATE OR DISTRICT	Total New Wells of 1943 (Total of Above Groups)			Wells Drilled Deeper, 1943			All Wells, 1943			All Wells, 1942			Percent Change of 1943 From 1942		
	Wells	Footage	Av. Depth	Wells	Footage	Av. Depth	Wells	Footage	Av. Depth	Wells	Footage	Av. Depth	Wells	Footage	Av. Depth
Alabama	2	11,127	5564	.....	.....	....	2	11,127	5564	3	4,697	1565	— 33.3	+136.9	+255.5
Arizona	5	14,498	2900	.....	.....	....	5	14,498	2900	3	9,662	3221	+ 66.7	+ 50.1	— 10.0
Arkansas	258	1,212,892	4701	1	155	155	259	1,213,047	4685	230	1,251,651	5441	+ 12.6	— 3.1	— 13.9
California	1,444	4,583,539	3174	33	26,393	800	1,477	4,609,932	3121	826	3,507,846	4267	+ 78.8	+ 31.4	— 26.9
Colorado	34	92,181	2711	.....	.....	....	34	92,181	2711	15	71,800	4786	+126.7	+ 28.4	— 43.4
Florida	5	22,833	4566	.....	.....	....	5	22,833	4566	1	2,640	2640	+400.0	+764.8	+ 73.0
Georgia	4	13,660	3415	.....	.....	....	4	13,660	3415	2	6,519	3259	+100.0	+109.5	+ 4.8
Illinois	1,773	4,502,088	2539	39	13,783	353	1,812	4,515,871	2492	2,144	5,313,748	2477	— 15.5	— 15.0	+ 0.6
Indiana	300	551,293	1838	5	1,445	289	305	552,738	1812	395	643,558	1629	— 22.8	— 14.1	+ 11.2
Iowa	3	4,874	1625	.....	.....	....	3	4,874	1625	.....	.....	....	+	+	+
Kansas	1,714	5,762,368	3362	34	9,648	284	1,748	5,772,016	3302	1,618	4,972,946	3073	+ 8.0	+ 16.1	+ 7.5
Kentucky	425	794,977	1871	2	1,634	817	427	796,611	1866	168	259,137	1542	+154.2	+207.4	+ 21.0
Louisiana	667	4,452,183	6675	.....	.....	....	667	4,452,183	6675	913	6,064,392	6642	— 26.9	— 26.6	+ 0.5
North Louisiana	319	1,328,620	4165	.....	.....	....	319	1,328,620	4165	428	1,766,162	4026	— 25.5	— 24.8	+ 3.5
South Louisiana	348	3,123,563	8976	.....	.....	....	348	3,123,563	8976	485	4,298,230	8852	— 28.2	— 27.3	+ 1.4
Michigan	595	1,541,547	2591	9	8,155	906	604	1,549,702	2566	666	1,686,655	2532	— 9.3	— 8.1	+ 1.3
Mississippi	87	474,217	5451	.....	.....	....	87	474,217	5451	101	535,517	5302	— 13.9	— 11.4	+ 2.8
Missouri	29	24,304	838	.....	.....	....	29	24,304	838	34	22,894	673	— 14.7	+ 6.2	+ 24.5
Montana	242	531,846	2198	.....	.....	....	242	531,846	2198	193	425,947	2206	+ 25.4	+ 24.9	— 0.4
Nebraska	39	98,504	2538	.....	.....	....	39	98,504	2538	28	66,072	2359	+ 39.3	+ 49.1	+ 7.6
New Mexico	258	797,420	3090	13	2,750	211	271	800,170	2953	384	1,093,064	2846	— 29.4	— 26.8	+ 3.8
New York	1,241	1,713,195	1380	.....	.....	....	1,241	1,713,195	1380	1,228	1,611,034	1311	+ 1.1	+ 6.3	+ 5.3
Ohio	725	1,859,447	2565	12	5,098	425	737	1,864,545	2530	1,134	2,674,126	2358	— 35.0	— 30.3	+ 7.3
Oklahoma	1,358	4,460,541	3285	108	54,577	505	1,466	4,515,118	3080	1,454	4,372,809	3007	+ .82	+ 3.3	+ 2.4
Pennsylvania	2,519	4,348,306	1726	10	4,227	423	2,529	4,352,533	1721	3,845	6,433,355	1673	— 34.2	— 32.3	+ 2.9
Tennessee	6	6,134	1022	.....	.....	....	6	6,134	1022	9	14,370	1596	— 33.3	— 57.3	— 36.0
Texas	4,227	18,120,815	4287	143	55,361	387	4,370	18,176,176	4159	5,198	21,531,654	4142	— 15.9	— 15.6	+ 0.4
East Texas Border Counties	18	114,294	6360	.....	.....	....	18	114,294	6360	2	10,966	5483	+800.0	+942.2	+ 16.0
East Texas Field	5	11,950	2975	.....	.....	....	5	11,950	2975	17	58,123	3419	— 70.6	— 79.4	— 13.0
Rest of East Texas	254	1,399,208	5509	1	1,301	1301	255	1,400,509	5492	397	1,960,511	4938	— 35.8	— 28.6	+ 11.2
North Texas	1,070	2,926,923	2735	38	18,147	478	1,108	2,945,070	2658	910	2,374,924	2609	+ 21.8	+ 24.0	+ 1.9
West Central Texas	369	882,229	2391	25	9,319	373	394	891,548	2263	393	856,568	2179	+ .25	+ 4.1	+ 3.9
West Texas	903	4,042,639	4477	68	24,391	359	971	4,067,030	4182	1,380	5,776,998	4186	— 29.6	— 29.6	— 0.1
Texas Panhandle	195	604,658	3101	7	338	48	202	604,996	2995	367	1,102,840	3005	— 45.0	— 45.1	— 0.3
Gulf Coast, Upper	336	2,564,032	7631	1	355	355	337	2,564,387	7609	444	3,011,155	6752	— 24.1	— 14.8	+ 12.7
Gulf Coast, Lower	639	3,846,582	6020	2	455	227	641	3,847,037	6002	777	4,618,984	5944	— 17.5	— 16.7	+ 1.0
Southwest Texas	371	1,524,136	4108	1	1,055	1055	372	1,525,191	4100	401	1,426,762	3558	— 7.2	+ 6.9	+ 15.2
South Central Texas	67	204,164	3047	.....	.....	....	67	204,164	3047	110	333,823	3034	— 39.1	— 38.8	+ 0.4
West Virginia	699	1,931,171	2763	18	19,857	1100	717	1,951,028	2721	764	2,234,421	2924	— 6.2	— 12.7	— 6.9
Wyoming	126	535,736	4252	.....	.....	....	126	535,736	4252	98	368,824	3763	+ 28.6	+ 45.3	+ 13.0
Total United States	18,785	58,461,696	3112	427	203,083	476	19,212	58,664,779	3054	21454	65,179,338	3038	— 10.5	— 10.0	+ 0.5

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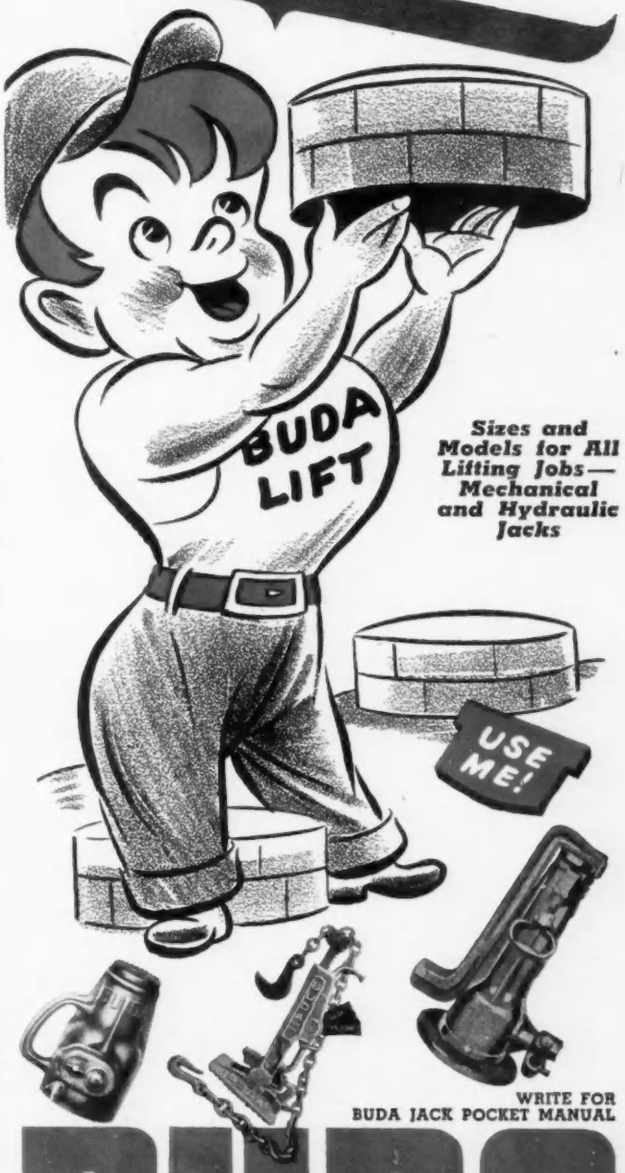

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War Emergency Projects Account For Bulk of New Pipe Line Work

Construction during 1943 in excess of 7000 miles for the third consecutive year; deliveries to East Coast nearing 60 percent of total transported by pre-war ocean tankers

PIPE-LINE construction in the United States during 1943 exceeded 7000 miles for the third consecutive year. A total of 7671 miles was completed, a figure greater than that for either 1941 or 1942. The enormous government-industry war emergency program begun in 1941 and pushed forward with all possible speed in 1942, was continued last year and was largely completed. Of total mileage built, 7005 miles were a part of the war emergency activity consisting of government-sponsored projects.

These projects for the greater part were designed to restore the movement of crude oil to the Atlantic Seaboard which due to depredations of submarine warfare was practically shut off in 1941. Total pipe-line mileage constructed during 1941, 1942 and 1943 is significant indication of how extensive the effort has been to replace the volume of oil that prior to this period moved eastward by tanker. Starting with 7300 miles in 1941, the figure grew progressively larger with 7550 miles in 1942, and reached the impressive total mentioned above, 7671 miles of pipe line completed in 1943. Prior to 1941 the yearly total had averaged about 3000 miles for several years.

A breakdown of 1943 activity shows 3430 miles of government-built oil line and 3575 miles of products line built under the same procedure. Construction by private companies amounted to 365 miles of oil line, 39 miles of products line, and 262 miles of gas line.

The carry-over for lines under construction at the end of 1943 was 883 miles of government-project lines and 1488 miles of privately-built lines.

This total carry-over amounting to 2371 miles is a good start for 1944 and is a larger total for lines under construction at the end of the year than at any year-end for the past four years. All projected government work is due to be completed this year, however; and unless some unforeseen greater emergency arises, line construction this year may decrease substantially.

With important new oil reserves found in Wyoming, it is probable that this region will experience some new pipe line construction. Two PAW projects have been approved, but construction has not yet commenced on them. Further discoveries might result in the laying of transcontinental systems to provide facilities that would place this region's oil at accessible spots, perhaps the West Coast.

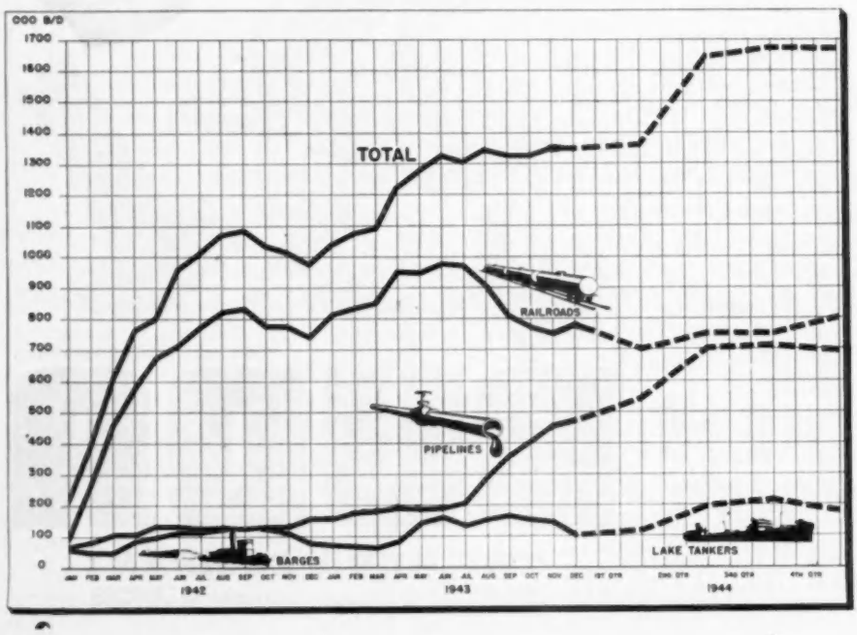
There is remote possibility that a new line might be constructed from West Texas to California. Such an undertaking has been suggested to as-

U. S. Pipe Line Construction Trend

YEAR	MILES OF PIPE LINES COMPLETED				*Miles Building
	Oil	Product	Gas	Total	
1943	3795	3614	262	7671	2371
1942	4200	2100	1250	7550	1715
1941	2900	2700	1700	7300	768
1940	1615	575	810	3000	1150
1939	3155	840	305	4300	1220
Breakdown of 1943 Activity:					
Government Projects	3430	3575	....	7005	883
Other	365	39	262	666	1488
Breakdown of 1942 Activity:					
Government Projects	3188	1730	....	4918	1423
Other	1012	370	1250	2632	290

* In case of government projects during 1942 and 1943 consists of actual miles of pipe remaining to be laid, but in other projects consists of total length of lines on which construction still under way at the end of the year.

Capacities of Inland Transportation Facilities to East Coast



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Owner and Operator

J. H. (HERB) SMITH
Job Superintendent

F. A. (ARNOLD) SMITH
Manager of Construction

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DITCHERS
DOZERS

WELDERS
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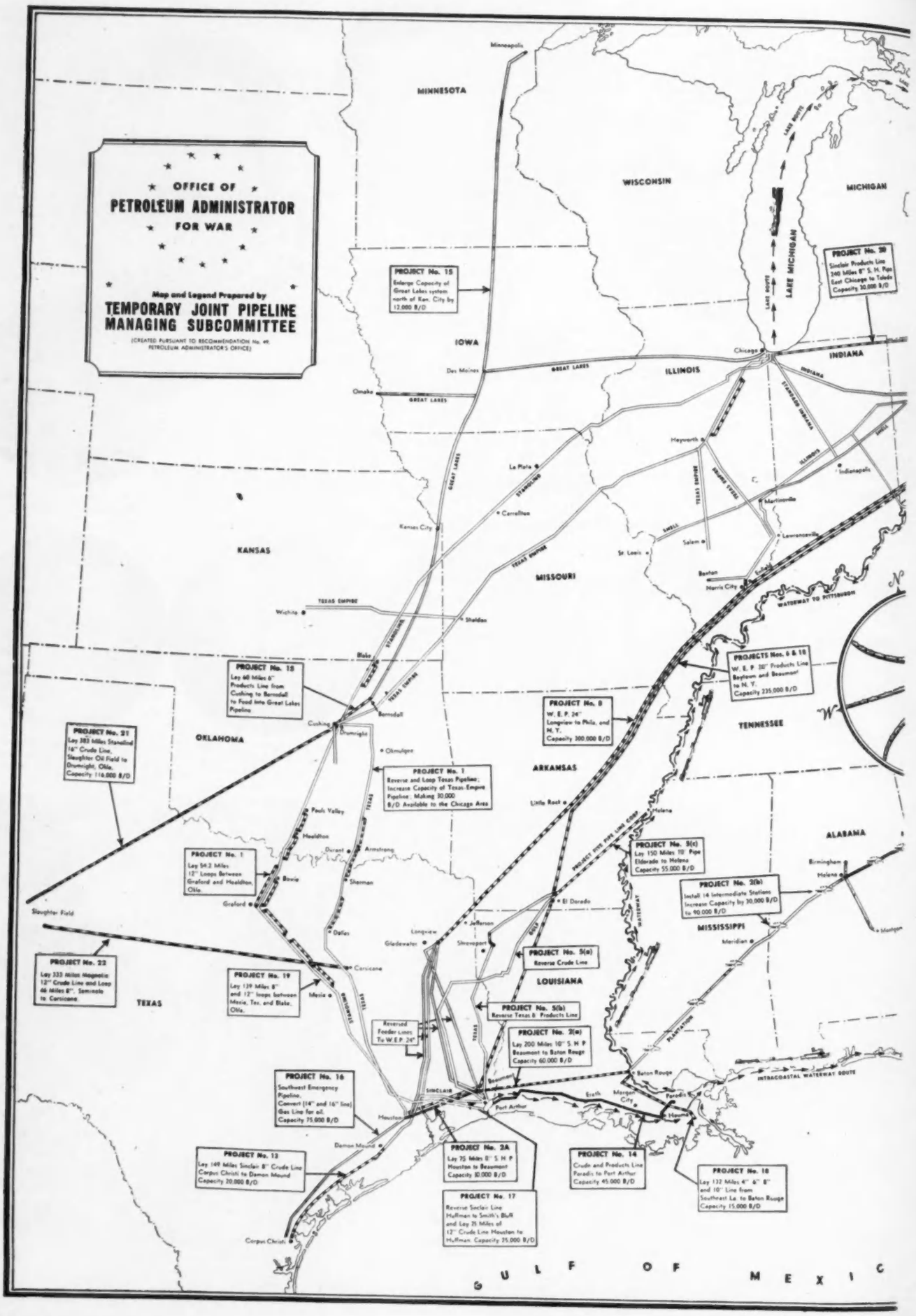
Superintendent of Ditching Machines and Heavy Equipment

CLIFTON DAVIDSON
Designing Engineer and Mechanical Technician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Map and Legend Prepared by
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MINNESOTA
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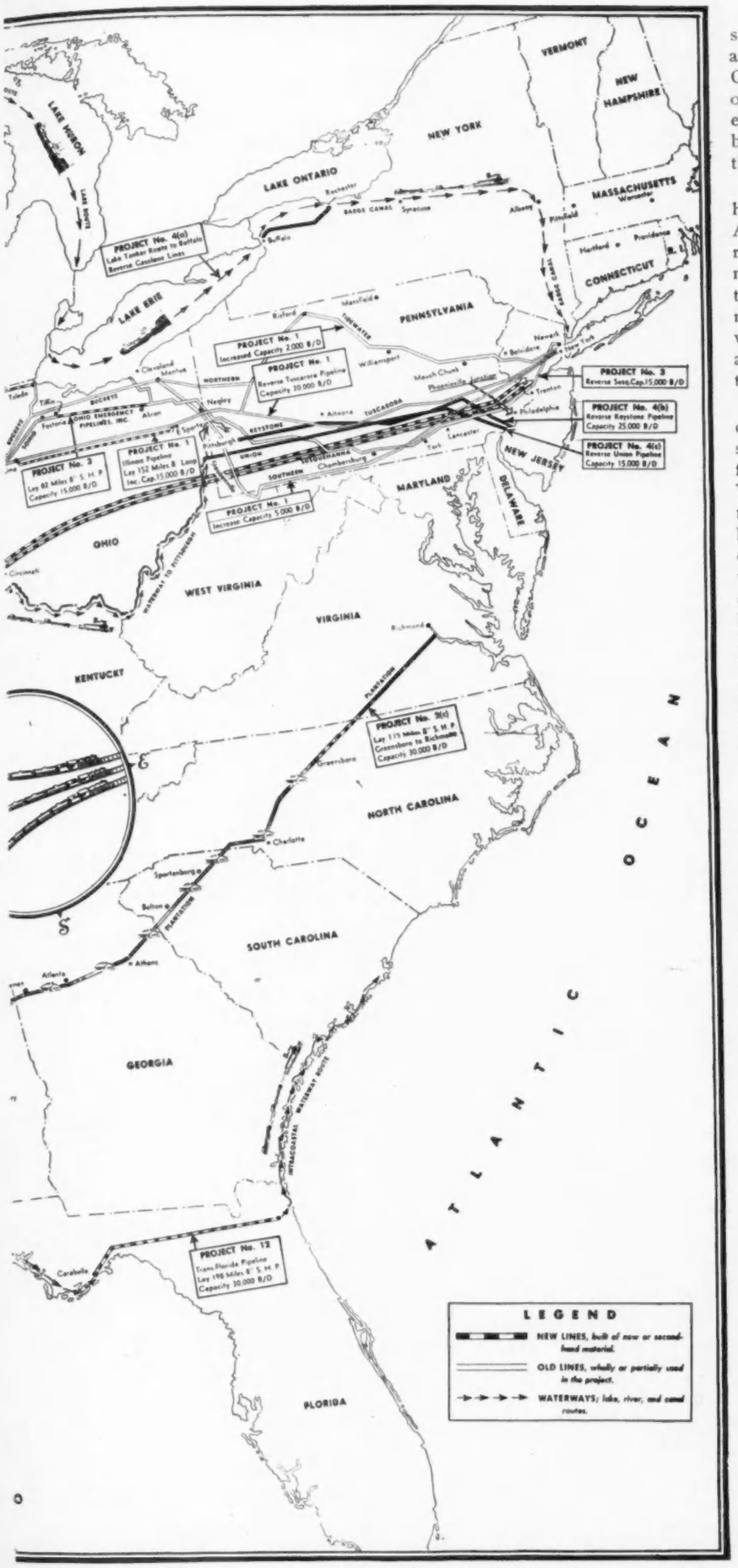
MICHIGAN
IOWA
ILLINOIS
INDIANA
KANSAS
MISSOURI
OKLAHOMA
ARKANSAS
TENNESSEE
MISSISSIPPI
ALABAMA
LOUISIANA
TEXAS
LAKE MICHIGAN
GULF OF MEXICO
PROJECT No. 15
Enlarge Capacity of Great Lakes system north of Kan. City by 12,000 B/D
PROJECT No. 20
Sinclair Products Line 240 Miles 8" S. H. Pipe East Chicago to Toledo Capacity 30,000 B/D
PROJECT No. 18
Lay 60 Miles 6" Products Line from Cushing to Bernadall to Feed into Great Lakes Pipeline
PROJECT No. 21
Lay 283 Miles Stanolind 16" Crude Line, Slaughter Oil Field to Drumright, Okla. Capacity 116,000 B/D
PROJECTS Nos. 6 & 10
W. E. P. 20" Products Line Beyfarm and Beaumont to N. Y. Capacity 235,000 B/D
PROJECT No. 9
W. E. P. 24" Longview to Phila. and N. Y. Capacity 300,000 B/D
PROJECT No. 1
Reverse and Loop Texas Pipeline; Increase Capacity of Texas-Empire Pipeline; Making 30,000 B/D Available to the Chicago Area
PROJECT No. 1
Lay 54.2 Miles 12" Loops Between Graford and Healdton, Okla.
PROJECT No. 5(c)
Lay 150 Miles 10" Pipe Eldorado to Malvern Capacity 55,000 B/D
PROJECT No. 2(b)
Install 14 Intermediate Stations, Increase Capacity by 30,000 B/D to 90,000 B/D
PROJECT No. 22
Lay 333 Miles Magnolia 12" Crude Line and Loop 46 Miles 8", Seminole to Corsicana
PROJECT No. 19
Lay 139 Miles 8" and 12" loops between Mexia, Tex. and Blake, Okla.
PROJECT No. 5(a)
Reverse Crude Line
PROJECT No. 5(b)
Reverse Texas & Products Line
Reversed Feeder Lines To W.E.P. 24"
PROJECT No. 2(a)
Lay 200 Miles 10" S. H. P. Beaumont to Baton Rouge Capacity 60,000 B/D
PROJECT No. 16
Southwest Emergency Pipeline. Convert (14" and 16" line) Gas Line for oil. Capacity 75,000 B/D
PROJECT No. 13
Lay 149 Miles Sinclair 8" Crude Line Corpus Christi to Damon Mound Capacity 20,000 B/D
PROJECT No. 2A
Lay 75 Miles 8" S. H. P. Houston to Beaumont Capacity 30,000 B/D
PROJECT No. 17
Reverse Sinclair Line Huffman to Smith's Bluff and Lay 25 Miles of 12" Crude Line Houston to Huffman. Capacity 25,000 B/D
PROJECT No. 14
Crude and Products Line Paradis to Port Arthur Capacity 45,000 B/D
PROJECT No. 10
Lay 132 Miles 4" 6" 8" and 10" Line from Southeast La. to Baton Rouge Capacity 15,000 B/D
Minneapolis
Chicago
Des Moines
Omaha
Kansas City
Wichita
Sheldon
Blake
Bernadall
Cushing
Drumright
Olmulgee
Healdton
Ardmore
Durant
Armstrong
Bowie
Graford
Sherman
Dallas
Longview
Gladewater
Jefferson
Shreveport
El Dorado
Little Rock
Helena
Birmingham
Meridian
Mexia
Corsicana
Slaughter Field
Houston
Port Arthur
Beaumont
Baton Rouge
Damon Mound
Corpus Christi
Heyworth
La Plata
Carrollton
St. Louis
Salem
Martinsville
Indianapolis
Lawrenceville
Benton
Norris City
Evansville
Paradis
Morgan City
Erath
Houma
Montgomery
LAKE ROUTE
GREAT LAKES
STANOLIND
TEXAS EMPIRE
SINCLAIR
MAGNOLIA
WATERWAY TO PITTSBURGH
INTRACOASTAL WATERWAY ROUTE
PLANTATION



Map showing government-industry war emergency pipe-line projects, including systems readjusted, and also inland water-borne traffic routes.

sure a supply of oil sufficient to meet any military emergency on the West Coast. No definite action has been taken on the suggestion, and the turn of events in connection with the war will be the basis for further consideration of the project.

Demand for crude on the West Coast has exceeded the supply since last April, with the deficiency increasing rapidly. Withdrawals from storage have made up the difference. Sooner or later the situation will become critical. How near that time is depends on when the war against Japan will be intensified and to what extent California becomes the base for part of these operations.

Most of the 2371 miles of line under construction at the end of the year consists of the 24-inch gas line being built from Corpus Christi, Texas, to West Virginia, by Tennessee Gas and Transmission Company. First pipe for this line was rolled on December 23. Numerous river crossings are now being worked on. Also work has started on compressor stations. Capacity of the line will be approximately 200,000,000 feet of gas daily. Cost of the project was originally set at $47,000,000, but this figure has been reduced somewhat and it is hoped to complete the line for around $30,000,000. Total mileage is 1188, not including the gathering or distribution systems.

The bulk of government crude oil project work still under way is comprised by Magnolia Pipe Line Company's 333-mile line from Midland to Corsicana, Texas, and Stanolind Pipe Line Company's 385-mile line from Slaughter, Texas, to Drumright, Oklahoma. Both these lines were designed to afford outlets for West Texas where the only surplus of crude oil exists awaiting transportation facilities. Capacity of the lines will be 107,000 barrels. Completion dates for both lines have been set for early this spring, not later than April 1.

The oil industry in the past year built numerous small connecting links to the West Texas area in an effort to speed up the movement to supply war demands.

The last remaining link in the major East Coast pipe-line program is the Little-Big-Inch, the 20-inch products line from Beaumont, Texas, which will be finished shortly. When this line is put into operation, it will be possible to deliver 700,000 barrels of crude oil and products into District 1 through Little-Big-Inch and Big-Inch which has been in operation for nearly a year. Crude

and products delivered through these lines, with 175,000 barrels daily by barge and lake tanker, and 750,000 barrels daily by tank car will give the East Coast a daily supply amounting to 1,625,000 barrels. In 1941, just prior to our entry into the war, District 1 received 1,540,000 barrels of petroleum daily, of which 1,160,000 barrels were moved in by tankers from domestic sources, 255,000 barrels were imported from foreign fields, and 118,000 barrels were supplied from Districts 2 and 3 by overland facilities.

Thus by this spring total pipe-line deliveries alone to the East Coast will amount to beter than 60 percent of pre-war tanker deliveries from domestic sources to that area.

Effects of the wartime transportation program are shown in an accompanying graph, giving actual deliveries by railroads, pipe lines and barges and lake tankers from the outbreak of the war through November, 1943, and as projected through 1944.

The war emergency pipe-line program initiated early in 1942 called for total expenditure of $264,000,000 of which $187,000,000 was provided by the government and $77,000,000 by the oil industry.

Undertaken in the face of stringent shortages of steel and other materials, 2826 miles of second-hand pipe was used in the construction of lines. Tankage was torn down and moved hundreds of miles for re-erection at pipe line terminals, and used engines and pumps were reconditioned and installed. Over 3300 miles of existing lines had to be reversed. Conversion of about 435 miles of natural gas lines to oil service was planned in addition to the gigantic program of new construction. The main network was developed in the spring of 1942, and the projects decided upon were put under construction as rapidly as possible.

The most spectacular undertaking was the Big-Inch, a 1364-mile line with 300,000-barrel capacity, from Longview, Texas, to the New York-Philadelphia area, which was completed during 1943. This line is of 24-inch pipe, originating at Longview and terminating at Phoenixville, Pennsylvania, where it splits into two 20-inch extensions to its destination.

Little-Big-Inch, the companion line, is a 1640-mile, 20-inch products carrier from the Houston-Beaumont, Texas, area to the Eastern seaboard, paralleling the right-of-way of Big-Inch from Little Rock, Arkansas, eastward.

These lines comprise the major projects of the government-financed program calling for $170,000,000 of the $187,000,000 put up by Defense Plant Corporation for pipe-line construction.

The remaining $17,000,000 of government money went into four other lines: Between Carrabelle and Jacksonville, Florida, the trans-Florida line was built at a cost of $4,200,000, with a capacity of 26,000 barrels daily; the 179-mile Southwest Emergency Line from Refugio, Texas, to Houston, a conversion job that provided a capacity of 75,000 barrels at a cost of $7,225,000; the 82-mile Ohio Emergency line between Tiffin and Doylestown, Ohio, cost $1,200,000 and provided 20,000 barrels daily capacity; and the Plantation line, a 175-mile extension from Greensboro, North Carolina, to Richmond, Virginia, cost $4,500,000 and provided 28,000 barrels daily capacity.

Government-Industry War Emergency Pipe Line Projects

Project 1

Increased crude movements north and east from Texas by enlargement of existing systems and reversing of Tuscarora line. Movements to Illinois increased by 40,000 barrels a day, of which 27,000 barrels a day reach eastern refineries. All industry financed at estimated cost of $5,000,000. Work started in 1942, some parts finished in that year; all parts completed in early 1943.

Part A—Texas into Oklahoma: Capacity of Texas Company line from Port Arthur to Stuart, Oklahoma, increased, and line reversed. Capacity of Stanolind line from Graford, Texas, to Healdton, Oklahoma, increased; connecting line to Hewitt, Oklahoma, built by Oklahoma Pipe Line Company.

Part B—Oklahoma and Kansas to Illinois: Capacity of Texas-Empire between Cushing, Okla., and Chicago, Ill., increased. Capacity of Stanolind line from Kansas City, Mo., to Chicago, increased. Capacity of Ajax line from Tulsa to Wood River, Ill., increased. Several river crossings replaced by Shell and Stanolind.

Part C—Illinois to East Coast: Capacity of Buckeye line between Mantua, Ohio, and Cooks Ferry, Pa., increased. Illinois Pipeline laid 152-mile 8-inch line parallelling the Lima-East Sparta, Ohio, line. Tuscarora's line between Negley, Ohio, and Bayway, New Jersey, reversed and converted to crude oil service. Capacity of four lines (National Transit, Northern, Tide Water, and Southern) in Pennsylvania increased.

Project 2

Plantation Pipe Line Projects to increase product movement to East. Work started in 1942, completed in early 1943.

Part A—Bayou Line: Bayou Pipe Line Company constructed 304 miles 10 and 8-inch between Baytown, Texas, and Baton Rouge, Louisiana, to feed 60,000 barrels a day of products to Plantation line. Privately financed at estimated cost of $7,400,000. Contractors: I. C. Little Company on 10-inch between Port Neches and Baton Rouge; O. R. Smith Construction Company on 8-inch between Baytown and Port Neches, and on 6-inch feeders.

Part B—Plantation Capacity Increased between Baton Rouge, La., and Greensboro, N. C., by installation of 14 new booster stations. Capacity increased from 60,000 to 90,000 barrels per day. Privately financed at estimated cost of $4,000,000.

Part C—Construction of 175-mile extension of plantation line from Greensboro to Richmond, Va. Capacity 28,000 barrels daily. Government financed at an estimated cost of $4,500,000.

Project 3

Shipping Capacity from Illinois eastward increased: An 82-mile 8-inch line constructed from Tiffing to Doylestown, Ohio. Capacity 20,000 barrels per day. Government financed at estimated cost of $1,200,000.

A 29-mile extension laid by Standard of Ohio to Randolph, Ohio, to connect with reversed Sun-Susquehanna line between Philadelphia and Cleveland. Capacity 15,000 barrels daily.

Standard of Ohio, Shell and Standard of Indiana made necessary extensions, connections and rearrangements to provide a through products line from Wood River, Illinois, to the East Coast.

Work on all projects started in 1942, completed in 1943.

Project 4

To Increase Pipe Line Capacity In East: All industry financed at estimated cost of $1,700,000. Work started in 1942, completed in 1943. Consisted of following:

Part A—Increased lake tanker movement into Buffalo for delivery through gasoline lines into New York State. Buffalo-Keystone line between Buffalo and Rochester reversed.

Part B—Keystone-Atlantic gasoline line from Philadelphia to Pittsburgh reversed and converted to crude service. Capacity 25,000 barrels daily.

Part C—Construction of 110-mile extension of Sinclair's Philadelphia-Pittsburgh products line to Steubenville, Ohio. That part of line from Schaefferstown, Pennsylvania, to Steubenville, Ohio, reversed to eastward service. Capacity 12,000 barrels a day. Branch from Schaefferstown to Baltimore, Md., was extended to Washington, D. C.

Project 5

Helena Line: Construction of 158-mile 10-inch products line from El Dorado to Helena, Arkansas. Capacity 55,000 barrels a day. Privately financed at estimated cost of $3,700,000. Contractors: Williams Bros. Corp.

Two lines from Port Arthur, Texas, were reversed (one of which was converted) and numerous extensions laid to provide adequate feeder capacity at El Dorado. From Helena products are barged up the Mississippi and Ohio Rivers to the Cincinnati-Pittsburgh area for transshipment by tank car to East Coast. All work completed in 1942.

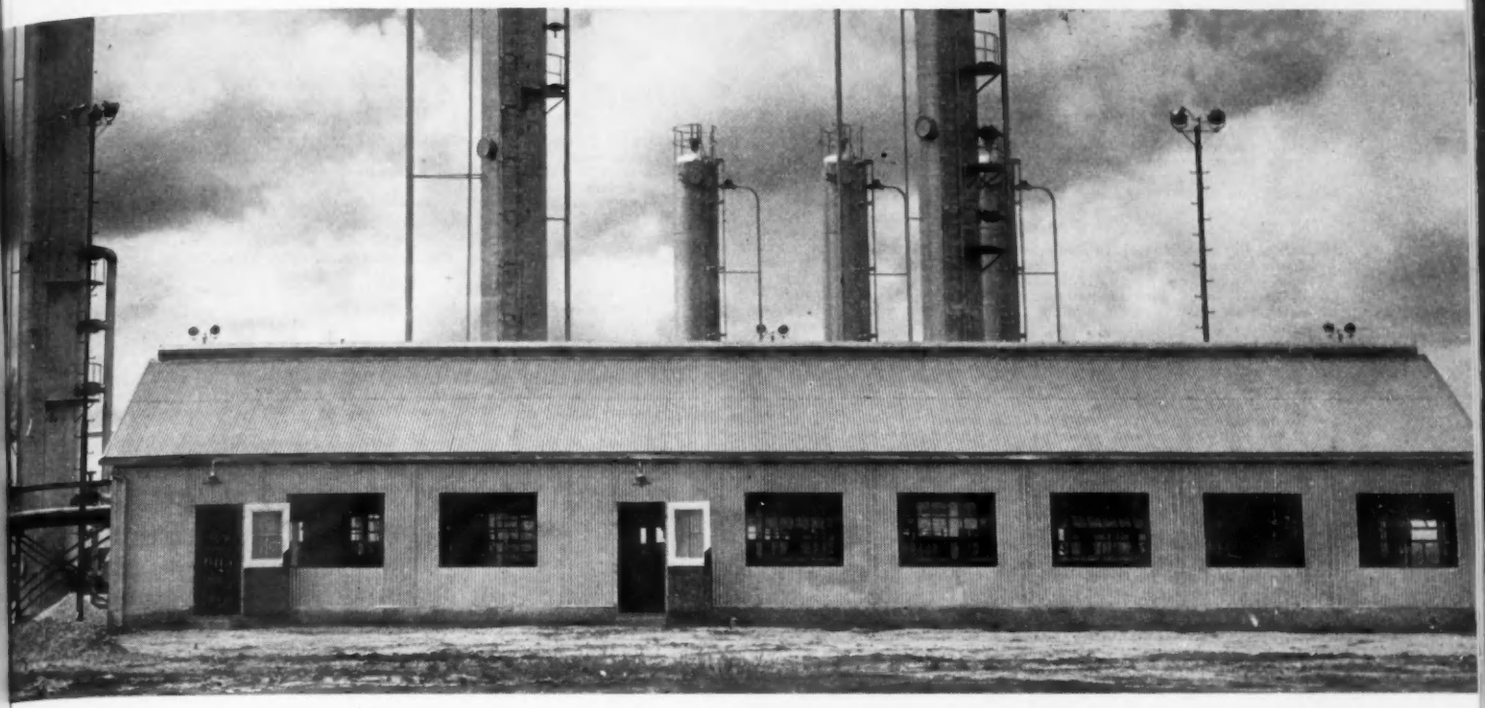
Projects 6 and 10

"Little-Big-Inch" Products Line: War Emergency Pipe Line, Inc., in 1943 commenced construction of 20-inch products line from Beaumont, Texas, to East Coast. Work almost completed by end of year. Government financed at estimated cost of $75,000,000. Consisted of 1640 miles of new construction, including 61-mile line from Beaumont to Baytown, 60 miles of feeder lines connecting refineries in Baytown area, 51 miles of lines in Beaumont area, and delivery lines in the New York Harbor area. Capacity 235,000 barrels a day of gasoline. Contractors: Williams Bros. Corp.; Sharman & Allen; N. A. Saigh Co.; Winston-Guthrie & Brown; B. & M. Construction Co.; Oil States Construction Co.; Swinerton & Walberg; Sheehan Pipe Line Construction Co.; Midwestern Engineering & Construction Co.; J. C. Truman Construction Co.; Ray L. Smith Construction Co.; C. S. Foreman Co.; Bechtel-Dempsey Co.; O. C. Whitaker Co.; I. C. Little Co.; Oklahoma Contracting Co.

Project 8

"Big-Inch" Crude Oil Line: War Emergency Pipe Line, Inc., 24-inch crude line from Longview, Texas, to New York-Philadelphia area. Government financed at estimated cost of $95,000,000. Started in 1942, leg from Longview to Norris City, Ill., put in operation in January, 1943, and leg from Norris City to East put in operation in early August, 1943. Consists of 1253 miles of 24-inch pipe, 111 miles of 20-inch pipe, and an extensive feeder system. From Phoenixville, Pa., 20-inch extensions to both Philadelphia and

Braden's KNOW HOW



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Linden, New Jersey, from which points refineries are served by short delivery lines. Capacity of system 300,000 barrels a day. Contractors: Williams Bros. Corp.; Dempsey Construction Co.; Oklahoma Contracting Co.; Anderson Brothers; C. S. Foreman; Sheehan Pipe Line Construction Co.; Ray L. Smith; Betchel & Dempsey; O. C. Whitaker; I. C. Little; Midwestern Engineering & Construction Co.; Exeter Construction Co.; Ford, Bacon & Davis.

To feed the "Big-Inch," War Emergency Pipelines built 50 miles of short links to handle different grades of crude, and four companies (Sun-Stanolind, Pan American, Shell and Atlantic) reversed their lines from East Texas field to Gulf Coast. Several other projects in Texas either feed 24-inch line or replace crude going into it.

Project 12

Trans-Florida Line: A 200-mile 8-inch line built from Carrabelle to Jacksonville, Florida. Government financed at an estimated cost of $4,200,000. Capacity 26,000 barrels a day. Line fed by barge on Gulf Intracoastal Waterway. Work started in 1942, completed in 1943. Contractors: Anderson Bros. laid line; Anderson Bros. and Fredell Construction Co. salvaged and reconditioned pipe from old system in Texas.

Project 13

Sinclair's Corpus Christi to Houston Line: 150-mile 8-inch new line from Corpus Christi to Damon Mound, Texas, to supply Southwest Texas crude to Houston refinery area to replace crude diverted from East Texas to "Big-Inch." Privately financed at estimated cost of $3,000,000. Capacity 25,000 barrels daily. Work started 1942, completed 1943. Contractor: O. C. Whitaker.

Project 14

Texas Pipe Line Company's 266-mile 8-inch and 10-inch new line from Paradis, Louisiana, to Port Arthur, Texas, to bring special Louisiana crudes to Texas' refinery for manufacture of butadiene and 100-octane gasoline. Privately financed at estimated cost of $5,500,000. Capacity 45,000 barrels a day. Work started in 1942, completed 1943. Contractors: Sharman & Allen; N. A. Saigh Company.

Project 15

Products Line from Cushing to Barnsdall, Okla., and Increased Capacity for Great Lakes Pipe Line: 65 miles of new feeder lines from Cushing-Drumright area to Barnsdall to connect with Great Lakes Pipe Line extending to Minneapolis and Chicago. Privately financed at estimated cost of $1,000,000. Capacity 10,000 barrels a day. Line subsequently purchased by Great Lakes company, which handles this additional gasoline through installation of 8 new booster stations between Kansas City, Kansas, and Minneapolis. Completed in 1942.

Project 16

Southwest Emergency Pipe Line: Purchase, reconditioning and conversion to crude serve of 150 miles of 14-inch and 16-inch natural gas line from Refugio to Pierce Junction, Texas. Construction of 26-mile 12-inch extension from Pierce Junction to Deer Park, 8 miles of line to connect with Shell's refinery at Houston, terminal facilities at Houston, and 3 miles of 12-inch line at Refugio. Government financed at an estimated cost of $7,225,000. Capacity 75,000,000 barrels a day. Contractors: O. C. Whitaker; Williams Bros.

Five lines from Refugio to Corpus Christi, Ingleside and Harbor Island reversed or extended to feed Southwest and West Texas crude to Refugio. West Texas crude brought to Ingleside and Harbor Island from Kemper, Texas, through Humble Pipe Line. Crude transported from Houston through reversed Pan American and Shell lines to 24-inch "Big-Inch" line. All work completed in 1943.

Project 17

Sinclair's Houston to Huffman Line: A 29-mile 12-inch new line built from Houston to Huffman. Privately financed at estimated cost of $900,000. Capacity 50,000 barrels a day. Sinclair's line from Huffman to Smiths Bluff, Texas, where it connects with Atlantic's reversed line from Atreco to Longview, reversed. Completed in 1943. Contractor: O. C. Whitaker.

Project 18

Crude Line from Southeastern Louisiana to Baton Rouge: Standard of Louisiana constructed 109 miles of 6-inch, 8-inch and 10-inch main line and 24 miles of feeder lines from Golden Meadows field and other South Louisiana fields to Baton Rouge refinery. Privately financed at estimated cost of $1,500,000. Capacity 15,000 barrels a day. Completed 1943. Contractor: Sharman & Allen.

Project 19

Enlargement of Stanolind's Crude Line Between Mexia, Texas, and Humboldt, Kansas: Installation of additional pumping equipment and 139 miles of 8-inch and 10-inch loops. Privately financed at estimated cost of $1,600,000. Capacity of system increased by 20,000 barrels a day. Completed in 1943. Contractors: I. C. Little; Jones & Brooks.

Project 20

Products Line from East Chicago, Indiana, to Toledo, Ohio: Sinclair has under construction a 250-mile 8-inch 30,000-barrel per day products line. Privately financed at estimated cost of $6,000,000. Line will eliminate tanker movement via Lake Michigan and other waterways to Toledo.

Project 21

Stanolind's West Texas to Drumright, Oklahoma, Line: Construction under way on 385-mile 16-inch crude line from Slaughter field, West Texas, to Drumright, Oklahoma, to connect with existing lines extending north to Chicago and St. Louis refinery areas. Privately financed at estimated cost of $7,600,000. Capacity 65,000 barrels a day. Seven additional pump stations can be installed to boost capacity to 116,000 barrels a day. Contractors: I. C. Little; Sharman & Allen; Midwestern Engineers; O. C. Whitaker Co.

Project 22

Magnolia's West Texas to Corsicana, Texas, Line: Construction under way on 333-mile 12-inch line from Midland, Texas, to Corsicana, and on two 8-inch loops between Seminole and Midland which aggregate 46 miles. Privately financed at estimated cost of $6,000,000. Capacity 42,000 barrels a day. With installation of three additional stations capacity can be increased to 60,000 barrels a day. Contractors: Jones & Brooks; Williams Bros.; Oklahoma Contracting Co.

Project 23

Yale Pipe Line System in Wyoming and Montana: Construction of 37½ miles of 6-inch and 45 miles of 8-inch crude oil pipe lines connecting the Elk Basin and Frannie Fields with refineries at Laurel and Billings, Montana. Privately financed at estimated cost of $830,000. Capacity 15,000 barrels a day. Project not yet started, but approval given.

Project 24

Stanolind Line from Elk Basin to Casper, Wyoming: Plan 70-mile 8-inch crude pipe line from Elk Basin to Little Buffalo Basin field and 160 miles of 10-inch line from Little Buffalo to Casper, with one 15,000-barrel-per-day pump station at Elk Basin and one 22,000-barrel-per-day pump station at Little Buffalo Basin. Privately financed at estimated cost of $4,000,000. Capacity can be increased to 44,000 barrels per day with additional pumping facilities. Construction not yet started.

Other Pipe Line Work in 1943

Kansas

Skelly Oil Company completed 28 miles of field lateral in Western Kansas, consisting of 14 miles of 4-inch from Kipp and Jordan fields to Iuka, and 14 miles of 6-inch from Iuka to main line at Cunningham. Capacity 12,000 barrels. Contractor: H. W. Knupt & Sons.

Kentucky

Oklahoma Pipe Line Company constructed 15 miles of 2-inch and 3-inch lateral system in Union and Henderson counties, serve production in Hitesville, Cario and Robards fields.

Louisiana

Hunt Oil Company completed a 6-mile 4-inch oil line to serve North Carterville pool, Bossier Parish.

Michigan

American Michigan Pipe Line Company completed 15-mile 12-inch gas line from Six Lake field station to Austin station. Contractor: Clif Dowding.

Consumers Power Company completed 6-mile 10-inch gas line extension from McBain to North Winterfield pool.

Consumers Power Company proposes 37-mile 10-inch gas line from Woodville pool, Newaygo County, to terminal at Six Lakes.

McCosta Pipe Line Company proposes 11-mile 6⅝-inch gas line from Goodwell pool, Newaygo County, to Big Rapids.

Leonard Pipe Line Company completed 10-mile 6-inch oil line between Winterfield and Freeman, Clare County. Contractor: H. L. Gentry Engineering Co.

Leonard Pipe Line Company completed 12-mile 6-inch oil line from Aetna field to Winterfield station. Contractor: H. L. Gentry Engineering Co.

Leonard Pipe Line Company completed 3-mile 4-inch line from Fork to Barryton truck loading station.

Dow Chemical Company completed 18-mile 6-inch gas line from Freeman to Evart. Contractor: H. L. Gentry Engineering Co.

Simrall Corporation compppleted 10-mile 6-inch line from Cedar to Evart. Contractor: H. L. Gentry Engineering Co.

Simrall Corporation completed 14-mile 8-inch line from Evart to Freeman. Contractor: H. L. Gentry Engineering Co.

Leonard Pipe Line and Simrall Corporation completed 3½-mile 4-inch line from Rose Lake field to Ashton.

Don Rayburn completed 4-mile 3-inch gas line from Moffatt field to Deep River station. Contractor: Northern.

Simrall Corporation completed 11-mile 4-inch oil line from Fork field to Evart station. Contractor: H. L. Gentry Engineering Co.

West Michigan Consumers Company completed 60-mile 8-inch gas line between Muskegon and Reed City field. Contractor: H. L. Gentry Engineering Co.

Oklahoma

Cities Service Transportation & Chemical Company is building 235-mile 26-inch gas line from Hugoton field, Oklahoma Panhandle, to Blackwell, Oklahoma. Capacity 140 million cubic feet daily. Contractor: Betchel, Dempsey & Price.

Oklahoma Natural Gas Company completed 35-mile 12-inch 40-million-cubic-foot gas line from Lula field, Coal County, to main line near Holdenville. Contractor: E. M. Campbell.

■ CONTINUED ON PAGE 138

set drill pipe the center latch Type G (Fig. 6) and the lighter Type LG (Fig. 7) and the side door Type B (Fig. 8) are illustrated; made also in other weights for loads from 20 to 300 tons.—The BJ Slip Casing Elevator (Fig. 9) has ample strength to carry the longest, heaviest strings of casing. The load is not carried under the coupling, but by large, non-crushing slips which set automatically when the coupling is contacted, or can be manually set at any desired point.

BJ TONGS

For heavy duty service the BJ Type B Tong (Fig. 10) fits all pipe sizes from 3½" to 10¾" by selecting the proper size lug jaw. The Type C Tong (Fig. 11) is for use on portable rigs and similar services on small diameter drill pipe. Each tong will fit all diameters from 2⅜" to 8⅝" by changing only one jaw.—The Type S Tong (Fig. 12) is ideal for use on seismograph shot hole rigs, for drilling with tubing, etc., and handles all required sizes of pipe used for such work.

BJ Elliott Wire Line Core Drills are used in all principal fields for their ability to take accurate, full-length cores from all formations combined with simplicity and safety of operation; see Fig. 13.

BJ PRODUCTION TOOLS

For handling tubing and rods there are various types and sizes of BJ Tubing and Rod Hooks, Tubing Tongs, Tubing and Rod Elevators.—The "Single" Hook (Fig. 14) may be replaced with the "Duplex" Body (Fig. 15) on BJ Combination Tubing Hooks to provide a handy combination for work-over jobs.—Snapon Tongs (Fig. 16) snap-on and lock-on the tubing, ratchet perfectly and release readily; other types are available.—BJ Tubing Catchers (Figs. 17 and 18) are low-cost insurance against a dropped or parted string of tubing.

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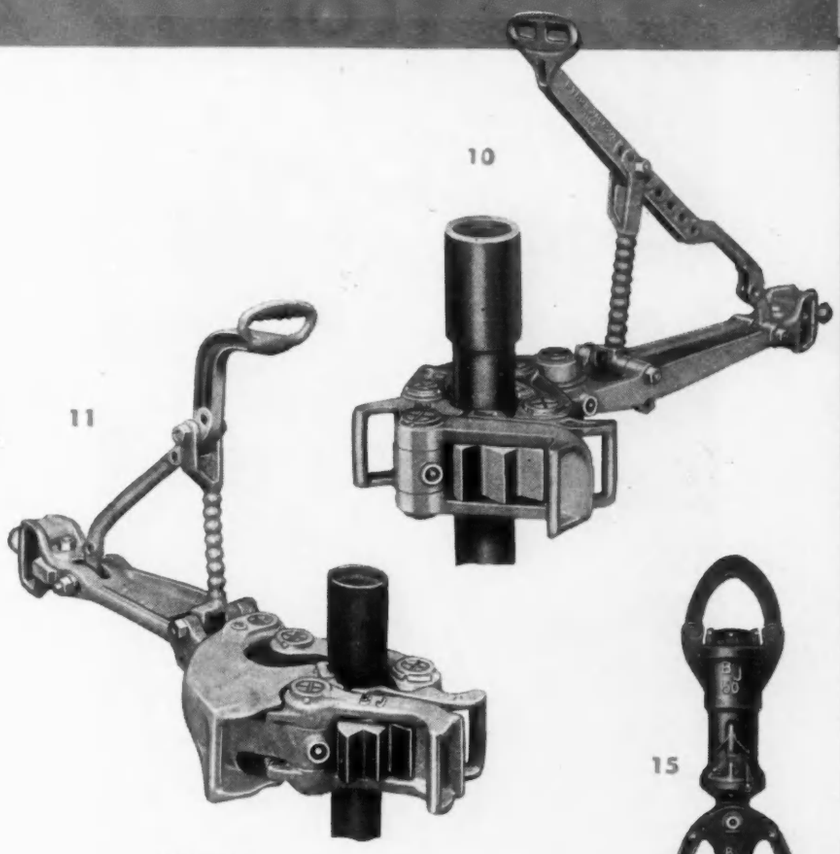

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West Texas

Atlantic Pipe Line Company extended West Texas system from Grand Falls to Abell field, using 9 miles of 6-inch and 8 miles of 4-inch salvaged pipe.

Cardinal Oil Company completed 6½-mile 2-inch oil line from Walker field to Shell Pipe Line's Taylor-Link field station.

Gulf Refining Company proposes to install 8 loops, embracing 73 miles of 10-inch, along its West Texas trunk line between Judkins and Ranger.

Humble Pipe Line Company completed 14-mile 4-inch crude line from Barnhart field, Reagan County, to its Kemper terminal.

Humble Pipe Line Company proposes 16-mile 6-inch oil line from Mascho field to booster station in North Cowden field.

Iraan Ice Company installed 5-mile 2-inch natural gas line from Noelke field to Iraan.

Little Inch Pipe Line Company completed 11½-mile 2½-inch oil outlet for Clara Couch field to Humble's Iraan station.

Magnolia Pipe Line Company completed 12-mile 4-inch oil line from Apco-Warner field to Abell field.

Magnolia Pipe Line Company built 5-mile 4-inch extension from Fullerton field to Union pool.

Magnolia Pipe Line Company installed 2 loops involving 62 miles 8-inch pipe, from Seminole via Andrews to Midland.

Phillips Petroleum Company extended its natural gasoline gathering system by laying a 7-mile 2½-inch extension from Goldsmith field to North Cowden.

Phillips Petroleum Company proposes 21-mile 3-inch natural gasoline line from Seminole west to connect with its Hobbs-Borger 8-inch product carrier.

Plymouth Oil Company built 12-mile 2½-inch oil line from Olson pool to Iraan station.

Shell Pipe Line Corporation supplemented its temporary outlet for Monahans field by laying 3 miles 6-inch crude line to Monahans station.

Shell Pipe Line Company has authorized laying of 4-mile 6-inch oil line from Wheeler-Ellenburger field to connect with Magnolia's Wink-Midland 10-inch line.

Stanolind Pipe Line Company working on 10-mile 8-inch oil line from Wasson field to tap Magnolia's trunk line.

Sunray Oil Company installed 5-mile 4-inch crude line from Northwest Slaughter field to Slaughter field.

The Texas-New Mexico Pipe Line Company building 15-mile combination 4 and 6-inch gravity line from Mabee field to its Slaughter-Midland carrier.

West Texas Gas Company completed 15-mile 10-inch loop near Plainview on its Panhandle-West Texas natural gas system.

West Texas Utilities Company built 21-mile 6-inch natural gas line from White-Banker and Walker areas to its electric generating plant near Girvin.

Southwest Texas

Magnolia Pipe Line Company completed 15-mile 6-inch oil line from Placedo field, Victoria County, to connect with Barnsdall's system at Vanderbilt. Capacity 10,000 barrels.

Sun Pipe Line Company has applied for PAW authority to build 84-mile 8-inch oil line from Harbor Island, near Corpus Christi, to Seeligson district, and 60-mile 6-inch line from Seeligson to scattered producing properties in Starr County.

Tennessee Gas & Transmission Company is building 1188-mile 24-inch 207-million-cubic-foot natural gas line from Corpus Christi to West Virginia. Contractors: Williams Bros. Corp.; Dempsey & Price; Brown & Root; N. A. Saigh; Henry L. Lemmons.

Magnolia Pipe Line Company installed 6-mile 10-inch loop between Nada and Ganado.

North Texas

Shell Pipe Line Company completed 5-mile 3-inch oil line from New York City pool, Clay County, to Magnolia's trunk line.

The Texas Pipe Line Company constructed 19-mile combination 2 and 3-inch oil line from Johnson Ranch pool, Foard County, to its Thalia station.

Phillips Petroleum Company is building 6-mile 3-inch natural gasoline line from Mankins to Shell Pipe Line system.

Lone Star Producing Company constructed 25-mile 4½-inch natural gasoline line from its Brooks plant, near Breckenridge, to its plant No. 101, near Ranger. Contractor: Sharman & Allen.

Gulf Refining Company extended to southwest portion of K-M-A field, involving 8-mile 4-inch oil line.

Sinclair Refining Company extended its Young County stem from Eliasville station to Murray pool, involving 3-mile 3-inch pipe.

Magnolia Pipe Line Company built 13-mile 8-inch loop at Cisco station. Contractor: Black Construction Company.

Stanolind Pipe Line Company completed 7½-mile 4-inch oil line between Boure station and Mueller field.

East Texas

Central Pipe Line Company completed 22-mile combination 4-inch and 6-inch oil line from Quitman field to Hawkins field.

Talco Pipe Line Company completed 30-mile 6-inch oil line from Coke field to Mt. Pleasant refinery. Second-hand materials used. Capacity, 6000 barrels.

Talco Pipe Line Company proposes 9-mile 4-inch oil line from Pittsburgh pool, Camp County, to main carrier from Coke field.

Gulf Refining Company proposes 13-mile 8-inch loop on its Port Arthur-Mid-Continent system, near Saltillo junction; and 27½-mile 8-inch from Big Sandy station to Longview station of War Emergency Pipelines, Inc. Projects designed to deliver 16,000 barrels of West Texas oil to "Big-Inch" line.

Lone Star Gas Company completed 24½-mile 16-inch and 10½-mile 12-inch gas line loops from north of Cayuga field to near Alma. Contractor: Sharman & Allen.

McCullough
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COMPLETION METHODS
Brown Line Print *No. 4*

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Set the casing through the oil and gas zones and cement the string solid. Then, with the McCullough Gun Tester, test the desired zones quickly and economically.

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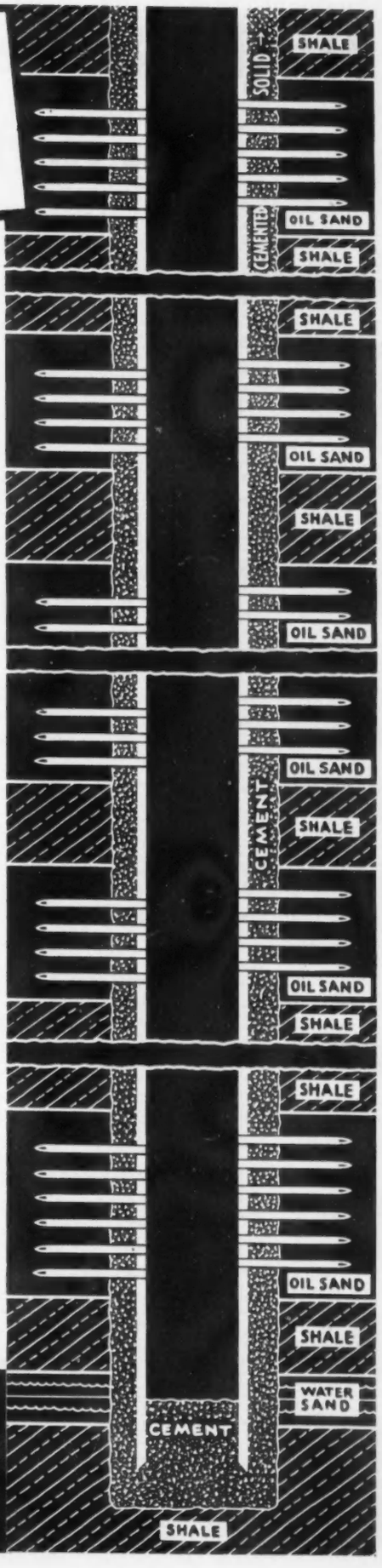

20 SERVICE LOCATIONS

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HOUSTON, TEXAS	TYLER, TEXAS	SHREVEPORT, LA.	CASPER, WYO.
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VICTORIA TEXAS	ALICE, TEXAS	LAKE CHARLES, LA.	VENTURA, CALIF.
CORPUS CHRISTI, TEX.	MAGNOLIA, ARK.	OKLA. CITY, OKLA.	BAKERSFIELD, CALIF.
GEO. WEST, TEXAS	NEW IBERIA, LA.	SEMINOLE, OKLA.	AVENAL, CALIF.

Highest Output of Natural Gas Recorded During 1943

Quarter trillion feet gain over 1942 is shown as industrial sales reach new all-time peak; civilian needs met despite huge expansion of facilities required for war manufacturing

IN SPITE of severe shortages of materials and manpower, the natural gas industry rates 1943 as a year of marked achievement. Total production reached three and one quarter trillion cubic feet, the highest output yet recorded, and a gain over 1942 of about a quarter trillion feet.

Industrial sales reached the all-time peak of 1,019,617,000,000 cubic feet, a percentage gain of 12.5 over 1942 sales. Natural gas companies grossed $633,195,000, an increase of 8.5 percent as compared with gross receipts during 1942. Sales of natural gas for domestic uses registered an increase of 6.1 percent, or 505,488,000,000 cubic feet. Natural gas used for generating electric power exceeded 1942 figures by 61,916,000,000 cubic feet, or a rise of 26.6 percent.

According to Ernest R. Acker, presi- of the American Gas Association, the most outstanding development in the industry in 1943 was expansion of facilities to increase the output of gas fuel needed by industry to meet every requirement of the war, while taking care of civilian needs at the same time. In addition to the question of basic supply, remarkable ability was shown by the industry to adjust its operations, personnel and economics to war conditions. It has accepted necessary governmental limitation and restrictions in good faith and has carried its full share of the responsibility for conservation of critical resources.

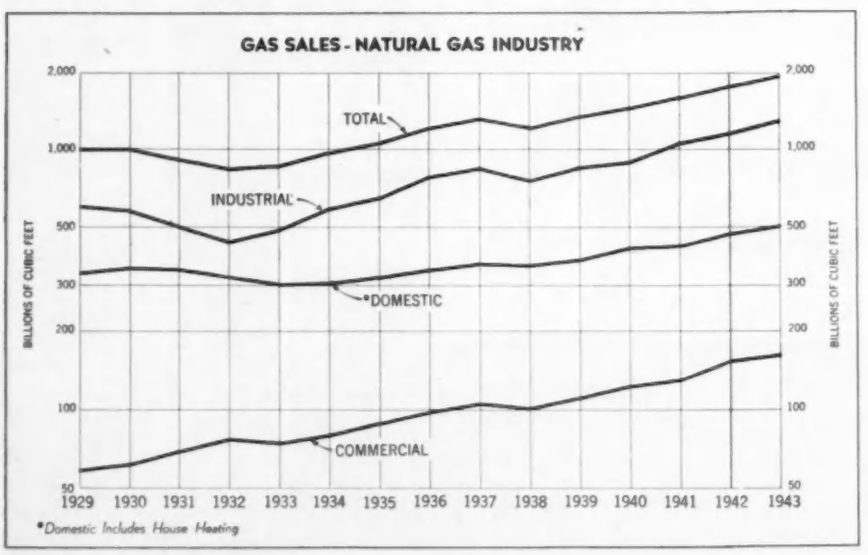
Evidencing a solid front in support of the war program, the industry has proved its flexibility to meet requirements of a growing market notwithstanding a multiplicity of shortages in both men and materials.

Essential needs of eight and three quarter million homes and business establishments were met, together with a substantial portion of the gas fuel requirements of almost two million additional customers who use mixed gas. An ever increasing quantity of natural gas was furnished for use in war manufacturing processes—up to 70 per cent of the total volume of natural gas delivered during the year to customers, exclusive of field use.

Many pipe-line companies selling gas to large volume consumers on an interruptible basis increased their annual load without the use of new critical materials in any substantial quantity.

Notable progress was made during the year in the integration of natural gas facilities, the development of underground storage, and the liquefaction of natural gas to provide increased storage in a minimum of space against winter peaks.

Although the war production program launched the greatest industrial heating revolution ever experienced, the peak of factory expansion and new factory construction required by the gas industry passed in 1943, and the program nears completion. Unparalleled quantities of modern, efficient industrial gas equipment were installed during this period, and older gas equipment was revamped in order to turn out new war products. The industrial gas loads that keep these war furnaces running day and night are the largest ever provided by the gas industry and, together with still further modernized and improved industrial gas equipment, will be the foundation for large and important industrial gas loads after the war.



Preliminary Estimates on Natural Gas Industry for 1943

	1943	1942	Percent Change
Customers:			
*Domestic	8,118,000	7,893,000	+ 2.9
Commercial	584,000	572,000	+ 2.1
Industrial	52,000	51,000	+ 2.0
Total	8,754,000	8,516,000	+ 2.8
Gas Sales (Mcf):			
*Domestic	505,488,000	476,426,000	+ 6.1
Commercial	163,699,000	152,562,000	+ 7.3
Industrial	1,019,617,000	906,059,000	+12.5
Electric Generation	294,683,000	232,767,000	+26.6
Total	1,983,487,000	1,767,814,000	+12.2
Revenue (Dollars):			
*Domestic	$330,702,000	$315,255,000	+ 4.9
Commercial	66,675,000	64,545,000	+ 3.3
Indust. & Electric Generation	235,818,000	203,790,000	+15.7
Total	$633,195,000	$583,590,000	+ 8.5

Prepared by Statistical Department American Gas Association.
*Includes house heating.

PRIME MOVER

on the waterways "Big Inch"

Numerous oil companies whose operations include the transport of petroleum and petroleum products through Gulf and inland waterways have commissioned Levingston to fill their needs for marine transportation equipment.

The above tug "Crown Central," a 74 foot, all-welded steel vessel, equipped with 400 h.p. Diesel engines, is one of the scores of such tugs of this general class designed and constructed by Levingston.

Levingston

SHIPBUILDING COMPANY

ORANGE TEXAS

War Needs Spur Refineries On To New All-Time High Figures

Total daily average run for 1943 quarter of million barrels ahead of 1942 mark; gasoline production spurts toward close of year with capacity runs in prospect to "keep 'em flying"

IN THE attempt to meet all military requirements for petroleum products and take care of civilian essentials, United States refining operations reached an all-time peak, a grand total of 1,427,142,000 barrels of crude oil being run to stills during the year, or a daily average of 3,912,168 barrels. These totals exceed the figure for 1942 by 257,092 barrels daily average, and 93,039,000 barrels for the year.

The outlook for the current year is even higher. Plants will certainly be called on to operate at capacity as the tempo of war increases and the demand for motor fuels shoots upward.

In spite of the great increase in aviation fuel facilities, construction may not have solved the problem. One of the greatest worries of the refiners in 1944 will be the question of making enough aviation gasoline to satisfy the hordes of planes that will be in operation.

The adjustment of refinery yields from normal to satisfy war demands which began in 1942, and continued through 1943, must be kept up this year. Only by the most careful adjustment of yields can the industry possibly hope to provide adequate quantities of all petroleum refinery products to fulfill war requirements.

That the adjustment of yields is certain to present an acute problem is indicated by recent trends in percent yield of major products: Whereas gasoline yields in 1942 were steadily downward, finally reaching the lowest level in years during April of 1943, when 35.3 percent of the crude oil charged to stills was made into motor fuel, it became necessary due to decline of gasoline stocks despite civilian rationing, to enlarge the yield of gasoline, and by October of last year, 38.6 percent of the crude runs to stills was made into gasoline.

Meanwhile every effort was being made to maintain the percent yield of residual fuel oil and distillate fuel oil at higher than normal levels, to meet record requirements. As the need for more gasoline grows, it naturally becomes more difficult to continue high yields of these fuel oils.

Trend of Refinery Input and Major Product Output

	1943	1942	1941
Input:			
Crude Runs	1,427,142,000	1,334,103,000	1,409,192,000
Output:			
Gasoline	622,000,000	608,900,000	701,294,000
Distillate Fuel	211,600,000	196,714,000	189,177,000
Residual Fuel	416,500,000	358,901,000	342,367,000

Data based upon Bureau of Mines reports, except for last two months of 1943 which are estimated with aid of API weekly reports.

Due to the increased yield of gasoline in the latter months of 1943, almost the same quantity of gasoline was produced in 1943 as in 1942, both of which were below the record established in 1941. Meanwhile the yield of residual fuel oil and distillate continued to grow, thus again establishing new peak levels in output of these latter products.

Efforts of the refining industry in the United States during 1943 were largely concentrated on making petroleum products for military purposes. In connection with the development of aviation gasoline and the establishment of synthetic rubber plants, the industry put through the largest construction program in its history, in addition to extensive conversion projects. Much development that was started in 1942 was completed, resulting in a number of new plants being put into operation for the first time during 1943. Other units are still in process of being built and will not be running before next summer or fall.

Important technical advances, most of them military secrets, were made in refining processes, especially in the manufacture of high-octane fuels. There were corresponding achievements in the perfection of special lubricants for use by the Army and Navy.

When completed this year, facilities for making aviation-grade motor fuels will consist of more than 300 plants. However, the core of the aviation-fuel program is built around 94 plants which will make all ingredients and blend them into 100-octane gasoline. Of these latter units, 32 were operating at the close of 1943; 40 are scheduled to go on stream during the first quarter of 1944, and 22 are being rushed to completion. The other plants are making aviation gasolines of octane rating lower than 100 or are furnishing ingredients to plants which finish the various aviation fuels.

This expansion, totaling more than $900,000,000, may not be adequate to fulfill 1944 military needs.

Refinery Operating Trends in 1943 and 1942

(Figures from Bureau of Mines, except for November and December, 1943, which are estimated.)

	CRUDE RUNS TO STILLS (Barrels)				PERCENT YIELD OF MAJOR PRODUCTS					
	Daily Average		Monthly Total		Gasoline		Residual Fuel		Distillate Fuel	
MONTH	1943	1942	1943	1942	1943	1942	1943	1942	1943	1942
January	3,600,000	3,839,000	111,606,000	119,032,000	36.5	44.6	29.2	24.7	15.5	14.2
February	3,641,000	3,781,000	101,935,000	105,870,000	36.7	42.8	30.2	25.8	15.9	14.4
March	3,613,000	3,571,000	112,013,000	110,725,000	35.8	41.8	29.2	25.4	15.4	14.7
April	3,732,000	3,498,000	111,945,000	104,962,000	*35.3	39.9	30.5	28.1	14.9	13.4
May	3,710,000	3,448,000	115,005,000	106,883,000	36.4	39.9	29.3	29.0	14.0	12.6
June	3,866,000	3,513,000	115,984,000	105,376,000	36.9	37.8	28.9	26.9	13.2	14.4
July	3,893,000	3,599,000	120,689,000	111,555,000	36.7	38.6	30.3	27.0	13.3	14.5
August	4,094,000	3,682,000	126,908,000	114,135,000	37.3	39.0	29.5	26.7	14.3	14.9
September	4,203,000	3,782,000	126,088,000	113,474,000	38.1	37.9	29.0	26.8	14.7	15.9
October	4,162,000	3,757,000	129,036,000	116,381,000	38.6	38.6	26.9	26.9	15.9	16.2
November	4,185,866	3,746,000	125,576,000	112,368,000	....	38.8	....	27.9	....	15.6
December	4,230,870	3,656,000	131,157,000	113,342,000	....	37.2	....	28.1	....	16.0
	3,912,168	3,655,076	1,427,142,000	1,334,103,000	....	39.8	....	26.9	...	14.7

* Lowest in years.

they used *Seamless*

THE war has made it necessary to get the utmost use out of oil field and refinery equipment. Drillers have been forced to conserve the limited strings available. Casing in old wells has been pulled and used over again. Even complete pipe lines have been dug up and laid down again in more important locations.

All this hard use and re-use of pipe and tubing has focused attention on how all-important is the matter of giving the utmost care and deliberation to "overall" or, "in the long run," economy in the selection of materials.

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UNITED STATES STEEL

Producing Oil Wells and Crude Oil Production in U. S. Fields

United States Summary

Field, *County*	Year of Discovery	Oil Producing Wells at End of 1943		*Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Arkansas	1920	350	2,957	81,324	27,605,361	607,306,068
†California	1876	1,698	20,013	801,468	284,491,413	6,370,626,125
Colorado	1887	19	162	6,863	2,424,501	46,811,190
Florida	1943		1	100	1,500	1,500
†Illinois	1889	260	26,037	219,640	82,196,929	1,011,853,795
Indiana	1889		1,827	13,855	5,300,680	150,564,680
Kansas	1889	410	25,825	270,000	106,060,000	1,381,516,000
Kentucky	1860	9	14,206	24,206	7,887,505	184,704,363
†Louisiana	1902	2,511	6,985	353,087	126,070,401	1,422,893,153
Michigan	1900	178	3,316	53,270	20,592,361	203,939,418
Mississippi	1933	15	373	46,860	18,826,880	67,593,030
Missouri	1889		128	217	36,000	257,000
Montana	1916	8	2,120	20,410	7,545,216	107,489,156
Nebraska	1939		92	1,635	741,840	4,181,440
†New Mexico	1913	2,662	3,880	113,775	38,972,672	383,763,567
New York	1864		22,190	13,000	5,001,000	144,794,000
Ohio	1860		23,350	8,800	3,277,000	598,707,000
†Oklahoma	1891	425	52,163	327,940	121,405,933	5,180,900,099
Pennsylvania	1859		85,000	40,200	15,641,000	1,036,828,000
Tennessee	1876		28	33	12,000	436,000
Texas	1896	37,831	98,452	1,878,190	587,996,979	8,215,758,808
Utah	1912		5	15	6,300	205,300
West Virginia	1860		17,400	8,500	3,338,000	421,115,000
Wyoming	1894	186	3,674	99,646	34,555,349	591,107,986
Total United States	1860	46,562	410,184	4,383,034	1,499,986,820	28,133,352,678

* Production figures as given here by individual fields being from various sources, differ slightly from those in table of United States, by states, by years, which are from U.S. Bureau of Mines.

† Summary of state by major districts given at beginning of details by fields.

Arkansas

Field, *County*	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Atlanta, *Columbia*	1938	21	22	2,405	909,372	3,770,492
Atlanta, West, *Columbia*		[1]2	[1]2	264	42,592	42,592
Cotton Valley Sand	1943	1	1	70	16,671	16,671
Reynolds Lime	1943	2	2	194	25,921	25,921
Big Creek, *Columbia*	1939	1	1	35	28,933	145,169
Bradley, *Lafayette*	1926					186,705
Buckner, *Columbia*	1937	8	29	1,918	662,267	4,056,024
Camden, *Ouachita*	1934					37,848
Champagnolle, *Union*	1927		76	689	248,057	15,428,569
Columbia, *Columbia*	1942	[6]	[6]		9,589	9,589
Dorcheat-Macedonia, *Columbia*		[2]70	[2]70	6,144	1,618,300	3,895,752
Cotton Valley Gas Sand	1942	[3]39	[3]39	1,422	532,883	599,789
Cotton Valley Oil Sand	1943	[4]26	[4]26	1,749	234,081	234,081
Reynolds Gas Lime	1939	[5]50	[5]50	2,973	851,336	3,058,882
El Dorado, East, *Union*	1921		60	581	190,967	9,801,606
El Dorado, South, *Union*	1920		104	896	322,252	49,051,859
Fouke, *Miller*	1940		22	1,600	482,153	1,009,111
Garland City, *Miller*	1932		8	172	85,596	2,157,903
Hampton, *Calhoun*	1943		1	9	3,100	3,100
Haynesville, *Columbia*	1942	8	9	820	202,081	203,141
Irma-Troy, *Nevada*	1921		117	1,372	555,116	10,153,834
Lewisville, *Lafayette*	1939		18	151	55,646	594,470
Lisbon, *Union*	1925		132	148	52,911	6,875,417
Magnolia, *Columbia*	1938	104	114	15,559	6,005,226	30,719,988
McKamie, *Lafayette*		18	19	3,180	376,861	2,070,917
Cotton Valley Sand	1942		1	30	12,303	27,938
Reynolds Lime	1940	18	18	3,150	364,558	2,042,979
Midway, *Lafayette*	1942	38	40	6,252	2,170,528	3,392,775
(Mt. Holly) McDonald, *Ouachita*	1929					117,085
Mt. Holly, *Union*		14	14	940	216,593	356,332
Cotton Valley Sand	1943	3	3	84	5,675	5,675
Reynolds Lime	1941	11	11	856	210,918	350,657
New London, *Union*	1942		19	1,300	354,407	422,372
Nick Springs, *Union*			10	152	66,012	681,354
Shallow	1940		10	152	60,056	675,398
Cotton Valley	1943				5,956	5,956
Patton, *Lafayette*	1941		[7]		8,065	33,584
Rodessa, *Miller*	1937		53	525	212,081	6,819,602
Schuler, *Union*		[8]49	[8]65	14,064	5,315,358	37,586,491
Cotton Valley Sand	1938	15	15	1,575	410,783	612,432
Jones Sand	1938	[8]21	[8]21	10,000	3,959,889	29,512,559
Morgan Sand	1938		14	501	197,442	2,705,138
Reynolds Lime	1938	13	15	1,988	747,244	4,756,362
Schuler, East, *Union*	1938	3	6	581	204,660	435,753
Smackover, *Ouachita-Union*	1922		1,585	11,895	4,460,354	398,375,483
Stephens, *Nevada-Ouachita-Columbia*	1922		202	401	233,513	9,006,108
Stephens-Smart, *Columbia*	1941		77	6,216	1,356,300	

Arkansas—Continued

Field, *County*	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Texarkana, *Miller*	1942	[6]	[6]		10,092	21,782
Urbana, *Union*			68	1,917	706,669	7,837,126
Shallow	1929		49	863	332,933	
Crain Sand			19	1,054	373,736	
Village, *Columbia*	1938	13	13	1,054	436,952	2,006,467
New Field Opened 9-17-43	1943	1	1	84	2,758	2,758
Total Arkansas		350 [9]508	2,957 [10]3,115	81,324	27,605,361	607,306,068

[1] West Atlanta: 2 wells drilled, including 1 dually completed. [2] Dorcheat-Macedonia: 70 wells drilled, including 25 completed in only single zone and 45 dually completed. [3] Includes only 5 wells completed merely in sandstone gas, 22 dually completed in limestone gas, and 12 dually completed in sandstone oil. [4] Includes 3 completed as oil wells only, 11 dually completed as limestone gas, and 12 dually completed as sandstone gas. [5] Includes 17 completed as limestone gas, 22 dually completed in sandstone gas, and 11 dually completed in sandstone oil. [6] Columbia and Texarkana each has 1 flowing well shut in. [7] Wells at Patton shut in. [8] Besides 21 flowing wells included here, Schuler field, Jones sand, has 110 flowing wells shut in. [9] Arkansas total flowing wells is 508, by including shut-in wells at Columbia (1), Texarkana (1) and Schuler (110), and by counting 45 dually completed wells at Dorcheat-Macedonia and 1 at West Atlanta as two wells each. [10] Arkansas total wells is 3,115 by including shut-in wells at Columbia (1), Texarkana (1), and Schuler (110); and by counting 45 dually completed wells at Dorcheat-Macedonia, and 1 at West Atlanta as 2 wells each.

California Summary

San Joaquin Valley		849	11,112	373,091	133,217,454	2,703,045,237
Coastal District		359	1,863	119,061	39,121,858	652,405,657
Los Angeles Basin		490	7,038	309,316	112,152,101	3,015,175,231
Total California		1,698	20,013	801,468	284,491,413	6,370,626,125

San Joaquin Valley

Antelope Hills, *Kern*	1942		18	2,135	764,465	849,307
Arvin, *Kern*	1939		*	48	31,189	1,584,789
Belridge, *Kern*		36	536	14,505	4,557,844	74,447,325
North	1934	34	59	5,794	2,140,439	47,949,528
South	1934	2	477	8,711	2,417,405	26,497,797
Buena Vista, *Kern*	1909	1	812	14,413	5,278,373	292,711,765
Burrel, *Fresno*	1943		*	161	9,425	9,425
Canal, *Kern*	1937	26	35	3,575	1,448,720	9,063,698
Canfield Ranch, *Kern*	1938		*	48	16,383	116,695
Coalinga, *Kern*	1896	205	1,500	88,672	31,384,381	436,759,264
East	1900		586	20,650	7,058,526	242,342,751
Nose		154	161	61,606	22,091,394	43,776,934
West	1900	51	753	6,416	2,234,461	150,639,579
Cole's Levee, *Kern*	1938	94	97	16,363	5,910,491	20,037,431
Dyer Creek, *Kern*	1941		*	21	8,986	27,827
Edison, *Kern*	1934	1	120	2,442	897,625	10,462,210
Elk Hills, *Kern*	1919	3	231	15,280	5,365,780	167,550,554
Fruitvale, *Kern*	1928	7	167	7,173	2,582,453	29,630,674
Greeley, *Kern*	1936	71	83	15,737	4,874,378	13,798,827
Helm, *Kern*	1941		*	645	162,471	235,090
Jacalitos, *Kern*	1941		*	322	118,137	177,375
Kern Front, *Kern*	1925			11,795	4,152,051	54,122,679
Kern River, *Kern*	1900		2,572	8,873	3,103,822	287,561,175
Kettleman Middle Dome, *Kings*	1932					544,491
Kettleman, North Dome, *Kings-Fresno*	1928	108	269	42,189	15,309,239	280,534,962
Lost Hills, *Kern*	1910		372	3,610	1,330,066	54,223,124
McClung, *Kern*	1943		*	322	20,271	20,271
McKittrick, *Kern*	1898		291	4,766	1,722,766	95,927,447
Midway-Sunset, *Kern*	1901	1	2,599	40,634	14,957,233	658,461,031
Mountain View, *Kern*	1933		151	1,622	1,384,444	42,961,582
Mount Poso, *Kern*	1927		455	23,601	8,441,817	71,353,266
Paloma, *Kern*	1939	4	4	1,143	301,398	788,179
Pleasant Valley, *Fresno*	1943	5	7	1,048	227,096	227,096
Raisin City, E, *Fresno*	1941		*	806	297,860	661,369
Raisin City, West, *Fresno*	1943		*	650	80,299	80,299
Rio Bravo, *Kern*	1937	97	99	14,865	5,447,019	21,667,565
Riverdale, *Kern*	1941		*	2,862	594,904	678,666
Round Mountain, *Kern*	1927		919	11,765	4,161,968	39,304,686
Shafter, *Kern*	1941		*	32	14,795	47,806

San Joaquin Valley—Continued

Field, County	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Strand, *Kern*	1939	17	17	1,756	665,728	2,282,058
Strand, East, *Kern*	1942			403	94,571	98,253
Ten Section, *Kern*	1936	114	117	15,499	6,571,191	26,803,416
Union Avenue, *Kern*	1941		*	177	43,717	162,602
Wasco, *Kern*	1938	8	12	2,745	782,939	2,936,745
Wheatville, *Kern*			*	64	15,065	17,295
Wheeler Ridge, *Kern*	1923		34	324	96,130	4,116,968
Unclassified Wells	....	51	295	.....	.....	.....
Total San Joaquin Valley	....	849	11,112	373,091	133,217,454	2,703,045,237

* Included in unclassified.

Coastal District

Capitan, *Santa Barbara*	1929		53	3,561	1,181,257	7,677,488
Elwood-Goleta, *Santa Barbara*	1927	4	66	6,436	1,666,522	70,981,999
Gato Ridge, *Santa Barbara*	1931		24	4,818	1,302,394	2,517,796
Newhall Potrero, *Los Angeles*	....		*	5,392	1,954,587	5,536,050
Padre Canyon, *Santa Barbara*	1936	4	20	1,001	345,034	700,785
Rincon, *Ventura*	1927	9	76	3,065	1,209,427	16,332,931
San Martinez, *Santa Barbara*	1941		*	1,371	470,867	704,702
San Miguelito, *Ventura*	1931	26	27	4,587	1,603,158	10,380,472
Santa Barbara, *Santa Barbara*	1929		14	92	42,947	3,566,959
Santa Maria-Lompoc, *Santa Barbara*	1902	1	242	11,267	3,777,529	163,030,928
Santa Maria Valley, *Santa Barbara*	1940	55	255	25,010	8,354,396	28,959,265
Summerland, *Santa Barbara*	1894		2	22	4,551	3,180,885
Ventura Avenue, *Ventura*	1926	188	431	47,901	15,514,708	256,747,244
Ventura-Newhall, *Ventura*	1876	60	591	4,514	1,684,002	81,697,531
Watsonville, *Ventura*	1923		*	24	10,479	390,622
Unclassified Wells	....	12	62	.....	.....	.....
Total Coastal District	....	359	1,863	119,061	39,121,858	652,405,657

* Included in unclassified.

Los Angeles Basin

Aliso Canyon, *Los Angeles*	1938	6	19	2,430	760,786	1,482,353
Brea-Olinda, *Orange*	1897	5	367	11,590	4,260,980	177,052,119
Buena Park, *Orange*	1942		*	135	49,203	89,194
Coyote, East, *Los Angeles*	1911	1	137	5,539	2,077,528	47,151,091
Coyote, West, *Los Angeles*	1909	24	154	12,396	4,438,766	134,289,135
Del Valle, *Los Angeles*	1940		*	1,208	449,365	717,773
Dominguez, *Los Angeles*	1923	30	301	22,874	9,114,280	147,383,079
El Segundo, *Los Angeles*	1936		34	971	364,914	10,932,087
Huntington Beach, *Orange*	1920	30	747	41,247	13,275,386	327,086,359
Inglewood, *Los Angeles*	1924	28	291	19,313	6,912,750	139,495,634
Lawndale, *Los Angeles*	1928		*	34	10,210	1,142,569
Long Beach, *Los Angeles*	1921		1,176	30,464	11,627,450	691,745,151
Los Angeles-Salt Lake, *Los Angeles*	1894		*	564	187,696	66,717,240
Montebello, *Los Angeles*	1917		345	10,840	3,960,339	135,364,449
Newport, *Orange*	1925		*	21	3,581	132,701
Oak Canyon, *Los Angeles*	1941		*	794	284,131	427,771
Playa del Rey, *Los Angeles*	1929		119	2,404	970,216	50,305,474
Potrero, *Los Angeles*	1927	5	24	926	337,532	4,951,153
Richfield, *Orange*	1919		298	6,812	2,681,154	101,124,451
Rosecrans, *Los Angeles*	1924	13	186	5,782	2,215,067	53,260,384
Santa Fe Springs, *Los Angeles*	1921		560	19,242	7,310,968	489,773,948
Seal Beach, *Los Angeles*	1926	4	97	7,098	2,860,864	95,806,332
Torrance, *Los Angeles*	1922		657	8,060	2,856,503	110,667,394
Turnbull, *Los Angeles*	1941		*	394	124,317	248,301
Whittier, *Los Angeles*	1912	1	160	1,004	376,294	19,116,930
Wilmington, *Los Angeles*	1937	340	1,163	96,314	34,359,724	208,367,002
Yorba Linda, *Los Angeles*	1942		*	860	282,097	345,157
Unclassified Wells	....	3	203	.....	.....	.....
Total Los Angeles Basin	....	490	7,038	309,316	112,152,101	3,015,175,231

* Included in unclassified.

Colorado

Berthoud, *Larimer*	1925		*1	*	*	63,429
Boulder, *Boulder*	1902		*7	*	*	659,454
Florence, *Fremont*	1862		50	110	42,452	13,824,489
Ft. Collins, *Larimer*	1923		9	101	37,209	2,298,401
Greasewood, *Weld*	1930		*2	*	.....	476,279
Hamilton, *Moffat*	1923		11	287	115,363	6,034,210
Hiawatha, *Moffat*	1929	8	8	349	153,905	507,136
Iles, *Moffat*	1924		-24	1,320	483,091	10,094,336
Powder Wash, *Moffat*	1936		3	122	42,389	119,579
Price, *Archuleta*	1934		9	1,000	395,700	2,024,991
Rangely, *Rio Blanco*	1919		18	809	284,449	1,561,745
Tow Creek, *Routt*	1924		9	121	46,999	1,831,935
Walden, *Jackson*	1927		.....	*	*	85,366
Wellington, *Larimer*	1924		10	81	60,838	5,062,776
Wilson Creek, *Rio Blanco*	1938	11	11	2,563	762,106	2,167,064
Total Colorado	....	19	162 †172	6,863	2,424,501	46,811,190

* Shut in. † Including 10 wells shut in.

Florida

Field, County	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Sunniland, *Collier*	1943	.....	1	100	1,500	1,500
Total Florida	....	.....	1	100	1,500	1,500

Illinois Summary

Eastern Illinois (Stripper Area)	....	.....	13,070	9,550	4,345,359	441,086,759
Northwestern Illinois (Stripper Area)	....	.....	304	250	96,630	2,983,630
Illinois Basin Old Pools	....	.....	351	590	230,680	9,495,180
Illinois Basin New Pools	....	†260	12,312	209,250	77,524,260	558,288,226
Total Illinois	....	†260	26,037	219,640	82,196,929	1,011,853,795

Illinois Fields

Eastern Illinois (Stripper Area)						
Total Eastern (Stripper)	....	.....	13,070	9,550	4,345,359	441,086,759
Northwestern Illinois (Stripper Area)						
Colmar-Plymouth, *McDonough-Hancock*	1914	.....	304	250	96,630	2,983,630
Illinois Basin (Old Pools)						
Bartelso, *Clinton*	1936	.....	42	150	60,010	849,010
Carlyle, *Clinton*	1911	.....	108	87	29,960	3,485,660
Junction City, *Marion*	....	.....	4	4	880	880
Sandoval, *Marion*	1909	.....	74	30	10,800	2,730,200
Wamac, *Marion*	1921	.....	51	33	12,230	458,430
Dupo, *St. Clair*	1928	.....	72	286	116,800	1,971,000
Total Illinois Basin (Old Pools)	....	.....	351	590	230,680	9,495,180
Illinois Basin (New Pools)						
Beaver Creek, *Bond*	1942	.....	2	12	4,620	7,726
Woburn, *Bond*	1940	.....	26	155	60,100	402,000
Bible Grove, *Clay*	1942	.....	67	1,450	731,095	1,022,408
Bible Grove, S., *Clay*	1942	.....	1	25	10,950	17,850
Iola, *Clay*	1939	.....	3	20	11,435	12,899
Iola, E., *Clay*	1941	.....	66	4,000	1,064,980	1,083,363
Ingraham, *Clay*	1942	.....	Abn'd.	.....	.....	323
Sailor Springs, *Clay*	1941	.....	46	995	303,740	807,240
Sailor Springs, S., *Clay*	1942	.....	8	750	77,170	104,010
Toliver, *Clay*	1942	.....	1	10	2,340	4,540
Boulder, *Clinton*	1942	.....	31	1,500	625,850	986,373
Hoffman, *Clinton*	1939	.....	42	160	70,260	432,660
Bartelso (Devonian), *Clinton*		.....	23	230	91,890	580,690
Posey, *Clinton*	1941	.....	1	.....	640	4,180
Centralia, *Clinton*	1937	.....	620	4,600	1,732,170	24,339,454
New Bellair, *Crawford*	1942	.....	1	3	2,495	7,595
Albion, *Edwards*	1940	.....	85	890	349,850	2,803,550
Albion, N., *Edwards*	1942	.....	1	6	2,220	5,120
Ellery, *Edwards*	1941	.....	2	12	6,750	29,136
Ellery, N., *Edwards*	1942	.....	1	3	1,825	2,846
Louden, *Fayette*	1937	.....	1,940	35,200	13,809,090	100,849,102
St. James, *Fayette*	1938	.....	186	2,825	1,140,505	6,803,805
St. Paul, *Fayette*	1941	.....	13	190	89,395	174,894
Akin, *Franklin*	1942	.....	7	320	106,945	144,131
Benton, *Franklin*	1941	.....	244	5,600	2,450,795	15,331,493
Sesser, *Franklin*	1942	.....	5	17	11,865	30,165
Thompsonville, *Franklin*	1940	.....	10	32	18,035	283,835
Herald, W., *Gallatin*	1942	.....	1	10	4,045	4,762
Inman, *Gallatin*	1940	.....	3	55	19,435	55,735
Inman, E., *Gallatin*	1940	.....	76	2,300	698,520	1,669,475
Inman, N., *Gallatin*	1941	.....	2	7	1,125	9,725
Inman, W., *Gallatin*	1942	.....	21	535	192,872	227,262
Junction, *Gallatin*	1939	.....	15	46	15,025	192,825
Bungay, *Hamilton*	1941	.....	15	2,400	152,205	157,703
Bungay, W., *Hamilton*	1942	.....	24	1,384	606,360	682,855
Dahlgren, *Hamilton*	1941	.....	37	135	54,660	862,560
Dale-Hoodville (been combined) *Hamilton*	1940	.....	390	10,500	3,771,550	16,007,496
Rural Hill, *Hamilton*	1941	.....	183	3,500	1,637,850	7,018,150
Rural Hill, S., *Hamilton*	1942	.....	5	245	99,580	146,280
Walpole, *Hamilton*	1941	.....	55	2,200	873,170	1,787,670
Elkville, *Jackson*	1941	.....	1	5	670	1,770
Dundas, E., *Jasper*	1942	.....	12	645	321,230	443,642
Hildalgo, *Jasper*	1940	.....	1	.....	395	9,968
North Boos, *Jasper*	1940	.....	71	995	601,640	2,251,345
Dix, *Jefferson*	1938	.....	83	1,405	524,960	3,544,570
King, *Jefferson*	1942	.....	26	550	268,760	299,501
Markham City, *Jefferson*	1942	.....	17	625	419,960	580,160
Roaches, *Jefferson*	1938	.....	12	76	38,110	440,410
Woodlawn, *Jefferson*	1940	.....	149	3,050	1,432,595	7,034,616

■ CONTINUED ON PAGE 148

Illinois Fields—Continued

Field, County	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
St. Jacob, *Madison*	1942		12	405	181,860	334,760
St. Jacob, S., *Madison*	1942		19	420	227,700	332,110
Alma, *Marion*	1941		2	27	11,865	38,865
Fairman, *Marion*	1939		28	360	148,250	887,407
Patoka, *Marion*	1937		103	700	291,760	3,141,960
Patoka, E., *Marion*	1941		55	1,175	472,585	1,815,985
Salem, *Marion*	1938		2,396	25,750	10,165,840	177,414,740
Sandoval (Devonian), *Marion*	1938		29	340	149,285	2,367,885
Tonti, *Marion*	1939		63	1,755	718,685	6,277,584
Tamaroa, *Perry*	1942		2		152	2,448
Amity, *Richland*	1942		1	18	2,585	3,685
Bonpas, *Richland*	1941		2	58	20,290	65,190
Bonpas, W., *Richland*	1941		3	32	15,970	96,870
Dundas Consolidated, *Richland*	1939		382	3,150	1,420,430	13,281,871
Noble, *Richland*	1937		163	5,050	2,025,478	13,830,178
Noble, S., *Richland*	1937		11	125	43,525	494,125
Olney, *Richland*	1937		36	500	153,210	1,357,810
Parkersburg, *Richland*	1941		43	1,570	645,075	2,809,361
Parkersburg, W., *Richland*	1943		2	375	37,685	37,685
Schnell, N., *Richland*	1942		8	580	30,140	30,716
Lakewood, *Shelby*	1941		2	14	6,420	22,249
Allendale (New), *Wabash*	1941		110	1,550	670,415	1,222,904
Friendsville, *Wabash*	1942		25	240	124,495	134,123
Griffin, *Wabash*	1939		324	2,650	1,152,125	9,085,825
Lancaster, *Wabash*	1940		17	210	60,500	547,100
Lancaster, W., *Wabash*	1943		5	350	62,660	62,660
Maud, *Wabash*	1940		15	95	37,625	347,625
Cordes, *Washington*	1939		130	785	350,826	2,505,026
Dubois, W., *Washington*	1942		1	6	2,435	4,201
Irvington, *Washington*	1940		83	1,275	552,125	2,814,825
Barnhill, *Wayne*	1939		56	275	103,750	1,686,450
Barnhill, E., *Wayne*	1941		11	1,250	144,815	179,698
Boyleston, *Wayne*	1938		103	1,125	464,400	3,553,200
Cisne, N., *Wayne*	1942		2	10	5,295	7,495
Cisne, *Wayne*	1937		47	375	154,061	2,803,161
Clay City, Consolidated, *Wayne*	1937		748	7,750	2,667,850	31,142,219
Coil, *Wayne*	1942		15	550	328,561	581,461
Coil, W., *Wayne*	1942		3	105	19,920	20,661
Covington, *Wayne*	1942		40	1,900	989,150	2,057,236
Enterprise, S. *Wayne*	1942		3	21	10,825	19,768
Fairfield, *Wayne*	1942		1	7	3,435	4,754
Geff, *Wayne*	1941		19	775	292,700	412,301
Geff, W., *Wayne*	1942		4	36	19,770	31,701
Golden Gate, *Wayne*	1942		1	22	13,900	30,672
Johnsonville, *Wayne*	1941		246	5,000	2,176,072	12,971,245
Johnsonville, S., *Wayne*	1942		3	12	8,943	11,143
Johnsonville, W., *Wayne*	1943		1	7	1,735	1,735
Mt. Erie, S.W., *Wayne*	1942		5	325	43,010	43,632
Maple Grove, *Wayne*	1943		17	2,350	207,320	207,320
Mayberry, *Wayne*	1941		5	115	55,700	162,800
Sims, *Wayne*	1941		62	1,650	910,160	2,535,162
North Aden, *Wayne*	1938		64	750	284,000	3,011,900
Burnt Prairie, *White*	1940		16	125	50,950	378,350
Carmi, N., *White*	1942		3	52	23,970	44,770
Centerville, *White*	1940		5	82	32,060	192,060
Concord, *White*	1942		2	12	7,330	15,070
Epworth, *White*	1941		9	120	53,930	154,130
Grayville, *White*	1939		3	50	18,770	168,070
Herald, *White*	1940		10	115	37,290	85,990
Iron, *White*	1940		29	370	158,650	1,875,050
Maunie, *White*	1941		2	20	7,970	20,130
Mill Shoals, *White*	1939		106	890	402,475	2,978,956
*New Harmony Consolidated, *White*	1939		710	15,800	5,420,680	24,654,602
New Haven, *White*	1941		22	220	88,820	388,220
Roland, *White*	1940		132	2,400	1,111,395	4,100,274
Stokes, *White*	1939		42	1,150	511,180	1,177,338
Storms, *White*	1939		143		466,740	4,145,440
Total Above Fields		†260	11,393	185,054	71,591,305	542,921,805
Unclassified, Basin New Fields			919	24,196	5,932,955	15,366,421
Total Illinois Basin New Pools		†260	12,312	209,250	77,524,260	558,288,226

* Includes "Calvin".
† Comparatively few flowing wells in Illinois estimated to total not over 260.

Indiana

Field, County	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
New Development:						
Griffin, *Gibson-Posey*	1938		412	5,750	2,245,790	15,275,090
Hazelton, *Gibson*	1941		20	410	147,190	333,790
Johnson, *Gibson*	1941		1	5	2,100	6,800
Kirksville, *Gibson*	1941		22	205	75,490	116,690
Mt. Carmel, *Gibson*	1941		1	6	2,650	7,950
Mt. Carmel, North, *Gibson*	1943		2	45	3,990	3,990
Owensville, North, *Gibson*	1943		7	225	20,045	20,045
Patoka, *Gibson*	1941		2		150	5,050
Wheeling, *Gibson*	1943		2	45	14,050	14,050
St. Francisville, *Knox*	1942		1	3	455	855
St Francisville, East, *Knox*	1943		1	8	4,230	4,230
St. Thomas, *Knox*	1940		6	15	6,120	71,220
Spurgeon, *Pike*	1941		2	27	11,040	26,240

Indiana—Continued

Field, County	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrel)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Bufkin, *Posey*	1940		11	60	30,480	127,880
Caborn, *Posey*	1940		33	505	214,400	565,700
Caborn, West, *Posey*	1941		6	18	9,580	34,680
Calvin, East, *Posey*	1940		13	330	146,850	621,830
College, *Posey*	1940		5	47	16,520	91,720
Grafton, *Posey*	1942		1			900
Griffin, South, *Posey*	1939		5	63	24,300	117,280
Half Moon, *Posey*	1942		1	7	2,830	6,730
Hensler, *Posey-Vanderburg*	1938		43	425	174,715	1,055,415
Hovey Lake, *Posey*	1942		1	9	2,740	3,740
Lamott, *Posey*	1941		3	30	12,960	35,460
Mt. Vernon, *Posey*	1941		21	1,260	487,610	1,216,810
New Harmony, *Posey*	1939		33	1,730	575,820	2,251,720
New Haven, *Posey*	1942		1	27	8,580	15,480
Point, *Posey*	1942		1	12	6,420	26,720
Prairie, *Posey*	1942		1	6	2,645	10,045
Ridge, *Posey*	1942		1	6	2,100	3,100
Rogers, *Posey*	1943		1	12	4,170	4,170
Rogers, East, *Posey*	1943		1	20	3,225	3,225
Stooker, *Posey*	1942		2	20	9,460	24,960
Wellborn, *Posey*	1941		1	15	4,260	13,760
Eureka, *Spencer*	1942		1	3	1,160	3,460
Dodds Ridge, *Sullivan*	1942		6	250	107,490	172,120
Vaughn, *Vanderburg*	1941		Abn'd			1,200
Vernon, *Vanderburg*	1941		21	205	80,880	102,480
Prairie Creek, *Vigo*	1937		14	172	66,850	665,950
Millersburg, *Warrick*	1941		Abn'd			2,700
Total New Development			706	11,976	4,529,345	23,065,135
Old Development:						
Bristow, *Perry*	1929		4	25	6,450	110,550
Canfield, Cannelsburg, Princeton and Oakland, *Daviess, Pike*	1907		600	700	303,800	14,203,250
Francisco, North, *Gibson*	1929		8	22	12,135	201,335
Shelburn, *Sullivan*	1911		341	495	196,980	7,351,880
Siosi, *Sullivan, Vigo*	1926		60	270	100,280	3,220,280
Spencer County			22	225	95,420	1,115,990
St. Wendells, *Posey-Vandenburg*			86	142	56,270	800,760
Total Old Developments, Above Fields			1,121	1,879	771,335	27,004,045
Total Above Fields			1,827	13,855	5,300,680	50,069,180
Miscellaneous Other Production						100,495,500
Grand Total, Indiana			1,827	13,855	5,300,680	150,564,680

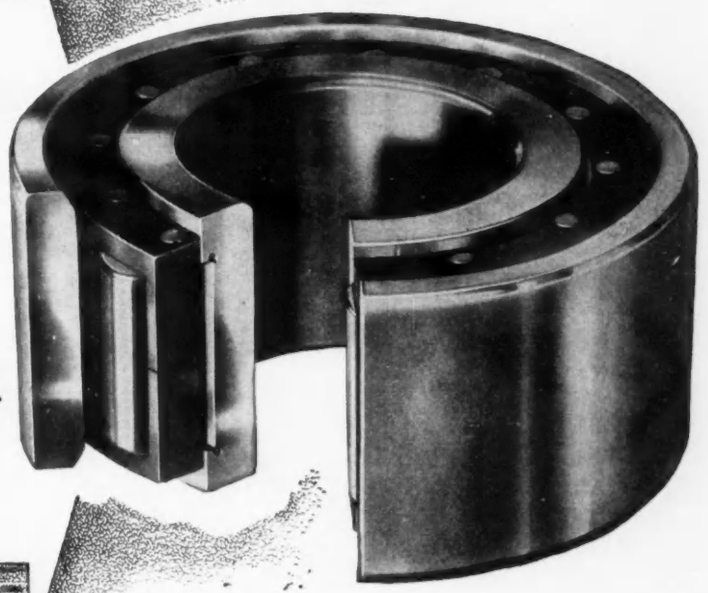
Kansas

Bear Creek, *Barber*	1942		1	25	3,330	3,330
Deerhead, *Barber*	1942		1	62	3,772	3,772
Lake City, *Barber*	1937		3	87	35,060	114,644
Sun City, *Barber*	1941		5	373	66,425	104,395
Turkey Creek, *Barber*	1943		1		2,831	2,831
Whelan, *Barber*	1934		18	629	197,940	898,628
Ainsworth, *Barton*	1936		67	1,930	572,338	3,207,109
Albert, *Barton*	1935		16	486	173,539	971,094
Ames, *Barton*	1943		1	29	5,548	5,548
Bahr, *Barton*	1943		1	27	3,140	3,140
Barrett, *Barton*	1943		1	27	9,212	9,212
Beaver, *Barton*	1934		2	54	122,277	1,657,817
Bloomer, *Barton*	1936		226	6,955	2,780,436	14,100,231
Boyd, *Barton*	1943		2	25	1,716	1,716
Davidson, *Barton*	1938				4,331	145,141
Eberhart, *Barton*	1935				109,588	453,063
Ellinwood, N., *Barton*	1937				4,171	55,071
Feltes, *Barton*	1939		16	549	247,255	672,085
Hagan, *Barton*	1938		4	93	37,701	107,281
Harrison, *Barton*	1943		1		995	995
Hiss, *Barton*	1936		5	147	52,362	390,272
Hoisington, *Barton*	1938		3	82	29,696	141,706
Kraft-Prusa, *Barton*	1937		301	10,465	4,107,115	9,651,775
Lanterman, *Barton*	1935		12	355	124,308	551,248
Marchand, W., *Barton*	1942		8	244	101,599	101,599
Merton, Regan, *Barton*	1942				2,864	10,124
Mue-Tam, *Barton*	1942				3,308	8,108
Rick, *Barton*	1936				16,933	362,893
Roessler, *Barton*	1943		1	27	6,982	6,982
Silica, *Barton*	1931		124	4,204	1,789,650	46,704,550
Susank, *Barton*	1943				15,014	15,014
Augusta, N., *Butler*	1914		63	325	122,790	16,336,055
Augusta, S., *Butler*	1916		142	640	222,500	43,183,400
Dunn's Mill, *Butler*	1942		1	64	27,085	28,208
El Dorado, *Butler*	1917		1,585	6,775	2,433,425	184,861,424
Haverhill, *Butler*	1927		69	460	140,405	3,468,905
Keighley, *Butler*	1925		3	89	34,012	34,012
Seward, *Butler*			14	26	10,980	982,780
Morrison, *Clark*	1936		2	10	4,990	140,445
Carson, *Cowley*	1924		16	120	46,020	3,213,686
Couch, *Cowley*	1937		21	572	198,415	586,848
Darien, *Cowley*	1939		5	162	56,828	227,106
Deichman, *Cowley*	1942		6	209	58,148	86,637
Eastman, *Cowley*	1924		33	150	52,590	2,487,594
Frog Hollow, *Cowley*	1937		43	1,072	439,314	1,511,076

■ CONTINUED ON PAGE 150

When **Costs Count**

OVERLOADED BEARINGS MUST GO!



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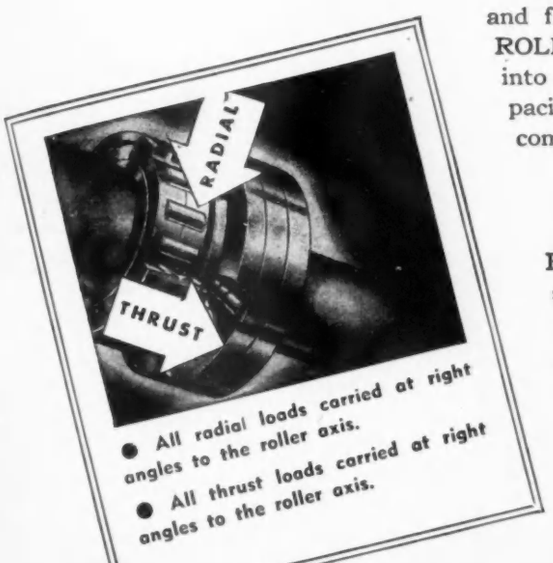

● All radial loads carried at right angles to the roller axis.

● All thrust loads carried at right angles to the roller axis.

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ROLLWAY BEARING COMPANY, INC., SYRACUSE, NEW YORK

BUILDING HEAVY-DUTY BEARINGS SINCE 1908 **BEARINGS**

Kansas—Continued

Field, County	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Frog Hollow, E., *Cowley*	1941		5	159	43,621	75,906
Gibson, *Cowley*	1941				3,837	66,626
Henderson, *Cowley*	1942		2	52	19,115	24,431
Hittle, *Cowley*	1926		63	1,864	773,029	4,791,329
Rahn, *Cowley*	1941		10	263	48,056	48,056
Rainbow Bend, *Cowley*	1923		115	685	233,205	13,847,369
Weathered, *Cowley*	1935		25	105	73,790	2,272,536
Bonnaccord, *Dickinson*	1943		2	31	3,848	3,848
Belpre, *Edwards*	1942			26	2,482	2,482
Beeching, *Ellis*	1943		3	129	7,030	7,030
Bemis-Shutts, *Ellis*	1935		453	15,562	5,824,253	27,067,198
Bemis, S., *Ellis*	1938		1	29	11,347	46,953
Blue Hill, *Ellis*	1937		19	582	190,567	737,987
Burnett, *Ellis*	1937		209	12,441	5,042,001	14,290,231
Emmeram, *Ellis*	1937				13,538	118,843
Ellis, *Ellis*	1943		11	360	58,028	58,028
Glathart, *Ellis*	1943		1	25	2,941	2,941
Herzog, *Ellis*	1940		4	150	56,748	152,168
Koblitz, *Ellis*	1937		8	211	89,511	306,751
Kraus, *Ellis*	1936				2,031	65,946
Leiker, *Ellis*	1943		2	30	4,782	4,782
Marshall, *Ellis*	1936				141,535	1,041,775
Penney, Wann, *Ellis*	1936		1	40	9,804	51,019
Richards, *Ellis*	1938				798	95,033
Riverview, *Ellis*	1943		5	354	15,446	15,446
Sugar Loaf, *Ellis*	1941		3	159	51,664	88,444
Toulon, *Ellis*	1935				1,553	198,140
Walter, *Ellis*	1936		37	1,359	546,125	2,473,535
Breford, *Ellsworth*	1932		20	606	248,828	248,828
Breford, *Ellsworth*			7	184	72,353	1,612,333
Heiken, N., *Ellsworth*	1942		2	51	19,084	19,084
Lorraine, *Ellsworth*	1934				107,293	8,848,418
Stoltenberg, *Ellsworth*	1931		179	6,069	2,249,806	10,744,581
Wilkens, *Ellsworth*	1934		68	344	918,633	3,207,518
Nunn, *Finney*	1938		2	101	30,711	176,316
Gettysburgh, *Graham*	1941				2,232	11,147
Morlan, *Graham*	1943		1	5	150	150
Morel, *Graham*	1938		26	1,768	569,077	1,087,747
Penokee, *Graham*	1940		1	25	8,985	37,795
Keller, *Greenwood*	1941		7	20	8,395	34,218
Heaston, *Harvey*	1941		1	24	9,440	9,440
Hollow-Nikkel, *Harvey*	1931				332,000	19,467,850
Sperling, *Harvey*	1935				8,512	399,812
Webster, *Hooks*	1943		1	31		
Patterson, *Kearney*	1941		3	91	42,380	82,650
Cunningham, *Kingman*	1931				315,723	3,761,118
Fanska, *Marion*			1	26	802	802
Lost Springs, *Marion*					56,873	56,873
Bornholdt, *McPherson*	1937		147	4,277	1,766,445	6,144,745
Canton, N., *McPherson*	1936				6,513	89,398
Crowther, *McPherson*	1942		14	629	189,479	193,729
Graber, *McPherson*	1934				55,767	6,998,817
Henne, *McPherson*	1940		20	784	249,794	418,424
Johnson, *McPherson*	1942				7,136	2,725,566
Lindsborg, *McPherson*	1942		89	3,001	932,672	1,206,402
Paden, *McPherson*			1	53	2,461	2,461
Rits-Canton, *McPherson*	1929				998,000	37,055,425
Roxbury, *McPherson*	1938		42	1,276	533,067	1,472,884
Voshell, *McPherson*	1929				46,106	24,111,113
Aldrich, *Ness*	1929		13	543	151,914	661,564
Hewitt, *Norton*	1941				2,230	13,198
Pawnee Rock, *Pawnee*	1936		25	915	365,254	1,001,850
Dayton, *Phillips*	1941		27	896	253,338	390,113
Hansen, *Phillips*	1943		5	158	26,085	26,085
Ray, *Phillips*	1940		74	3,389	1,141,760	2,085,985
Cairo, *Pratt*	1939		2	73	15,940	78,400
Carmi, *Pratt*	1942		65	5,688	961,215	961,215
Chitwood, *Pratt*	1943		3	199	7,902	7,902
Cunningham, *Pratt*	1943		7	239		
Frisbie, *Pratt*	1943		3	96	19,413	19,413
Iuka, *Pratt*	1937		22	608	222,796	444,581
Stark, *Pratt*	1943		9	483	77,528	77,528
Burrton, *Reno*	1931				34,351	35,214,961
Hilger, *Reno*	1934		36	1,054	389,014	2,762,204
Peace Creek, *Reno*	1941		133	4,409	2,862,539	3,827,134
Bowman, *Rice*	1936		6	147	60,109	138,043
Brandenstein, *Rice*	1933		2	55	20,420	410,443
Campbell, *Rice*	1938				2,635	2,635
Chase, *Rice*	1931		388	11,786	3,875,361	30,032,731
Doran, *Rice*	1936		6	175	56,255	229,405
Edwards, *Rice*	1936		87	2,616	973,727	4,947,412
Geneseo, *Rice*	1934		194	6,009	2,793,256	12,584,756
Haferman, *Rice*	1936		8	249	86,107	663,327
Heins, *Rice*	1938				660	52,170
Karber, *Rice*	1940		3	98	33,717	80,892
Keller, *Rice*	1943		1	30	4,100	4,100
Orth, *Rice*	1932		17	522	146,442	1,037,274
Pioneer, *Rice*	1942		1	30	11,838	15,288
Ploog, *Rice*	1930				4,714	1,317,759
Prospen, *Rice*	1943				837	837
Raymond, *Rice*	1929		67	2,238	826,549	7,829,329
Silica, *Rice*	1931		633	22,395	7,215,376	52,266,389
Smyres, *Rice*	1942		23	599	273,609	406,681
Volkland, *Rice*	1943		2	69	2,133	2,133
Wenke, *Rice*	1935		9	299	100,232	515,262
Wenke, W., *Rice*	1938		2	38	18,899	80,819
Barry, *Rooks*	1943		10	651	102,124	102,124
Dopita, *Rooks*	1934				5,964	227,334
Dorr, *Rooks*	1942		3	89	21,979	25,321
Erway, *Rooks*	1941		1	26	8,352	18,942
Kriley, *Rooks*	1943		1	25	2,581	2,581
Laton, *Rooks*	1927				39,869	1,766,139

Kansas—Continued

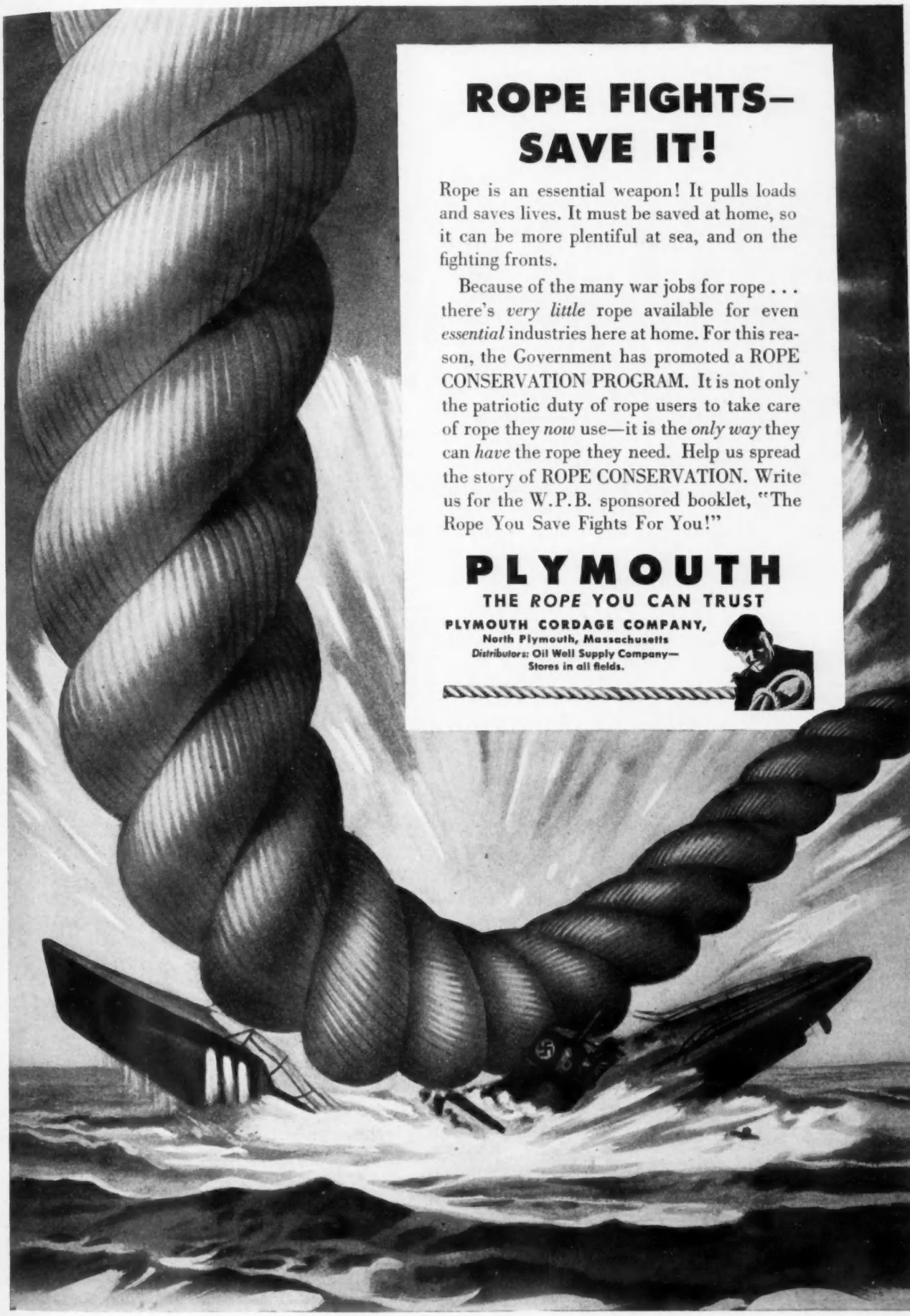
Field, County	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrel)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Ray, S.E., *Rooks*	1942		1	26	10,320	18,684
Stockton, *Rooks*	1943		1	25	2,019	2,019
Webster, *Rooks*	1930		1	31	1,921	61,290
Westhusin, *Rooks*	1936		15	527	153,323	678,018
Otis-Albert, *Rush*	1934		19	1,240	349,567	2,256,282
Atherton, *Russell*	1935				16,062	1,297,472
Big Creek, *Russell*	1935		55	1,787	582,917	4,240,247
Donovan, *Russell*	1935				4,275	87,065
Driscoll, *Russell*	1940		7	52	9,441	33,536
Dubuquet, *Russell*	1935		6	169	55,081	286,221
Forest Hill, *Russell*	1941		12	444	97,252	155,677
Gorham, *Russell*	1926		177	5,243	2,169,756	24,330,421
Greenvale, *Russell*	1938		72	2,181	750,734	1,655,839
Gustavson, *Russell*			6	175	35,997	50,292
Hall-Guerney, *Russell*	1931		57	1,857	1,994,579	15,581,149
Jerry, *Russell*	1943		1	29	11,126	11,126
Krug, *Russell*	1943				9,007	9,007
Rusch, *Russell*	1943		6	197	73,948	73,948
Russell, *Russell*	1934		1	28	201,992	5,438,567
Sellens, *Russell*	1929		3	108	19,236	2,779,876
Strecker, *Russell*	1943		1	28	5,844	5,844
Trapp, *Russell*	1939		903	29,029	10,737,786	45,958,696
Vaughan, *Russell*			34	985	344,137	1,674,027
Williamson, *Russell*	1936		36	991	193,791	252,386
Witt, *Russell*	1942				11,482	19,542
Hunter, *Saline*	1943		11	341	54,011	54,011
Pliny, *Saline*	1943		1	27	4,644	4,644
Salina, *Saline*	1943		1	40	8,236	8,236
Shallow Water, *Scott*	1934		9	280	97,077	1,249,637
Eastborough, *Sedgwick*	1938		39	350	132,495	8,335,930
Goodrich, *Sedgwick*	1928				113,407	3,310,769
Greenwich, *Sedgwick*	1929		42	505	192,750	9,718,600
Valley Center, *Sedgwick*	1928		67	715	276,580	20,821,103
Studley, *Sheridan*	1943		3	188	29,700	29,700
Ahnert, *Stafford*	1941				495	14,985
Bedford, *Stafford*	1940		21	757	244,133	719,118
Byron, *Stafford*	1943		1	49	2,404	2,404
Curtis, *Stafford*	1942		2	73	32,419	35,624
Drach, *Stafford*	1943		36	1,134	304,037	304,037
Farmington, *Stafford*	1943		3	175	23,346	23,346
Fischer, *Stafford*	1938		3	98	34,771	175,511
Gates, *Stafford*	1933		14	468	136,665	948,465
Grunder, *Stafford*	1943		1	25	4,044	4,044
Hazel, *Stafford*	1942		4	135	44,007	58,802
Jordan, *Stafford*	1936		7	175	69,294	429,696
Kipp, *Stafford*	1937		11	332	102,640	329,630
Leesburgh, *Stafford*	1938		16	842	434,063	1,010,413
Max, *Stafford*	1938		11	388	150,954	401,904
Mueller, *Stafford*	1938		5	112	35,233	35,233
Rattlesnake, *Stafford*	1938		1	26	9,673	51,963
Richardson, *Stafford*	1930		59	1,928	725,612	5,782,747
Riley, *Stafford*	1940		3	24	12,618	37,033
Rothgarn, *Stafford*	1943		3	104	14,482	14,482
St. John, *Stafford*	1935		24	648	282,602	1,547,582
Shaffer, *Stafford*	1941		6	172	57,458	181,708
Sittner, *Stafford*	1937				5,222	405,147
Sittner, S., *Stafford*	1938		19	602	204,591	780,031
Snider, *Stafford*	1936		2	45	27,458	249,658
Snider, S., *Stafford*	1938		8	209	98,113	321,053
Spangenberg, *Stafford*	1043		1	33	8,830	8,830
Stafford, *Stafford*	1940		21	947	500,996	1,105,866
Van Lieu, *Stafford*	1943		3	201	40,873	40,873
Zenith, *Stafford*	1937		350	12,477	3,934,044	14,280,294
Anness, *Sumner*	1937		1	32	13,069	66,959
Vernon, N., *Sumner*					12,927	12,927
Total, above data			8,558	217,492	87,065,050	877,902,602
Kansas, Unclassified			17,267	52,508	18,994,950	503,523,398
Total Kansas		*410	25,825	270,000	106,060,000	1,381,516,000

* Comparatively few flowing wells in Kansas estimated to total approximately 410, but details by fields not available to show here.

Kentucky

New Development:						
Belton, *Muhlenberg*			3	7	4,260	49,690
Birk City, *Daviess and Henderson*	1938		104	310	133,380	2,486,082
Cairo, *Henderson*	1943		1	8	3,860	3,860
Corydon, *Henderson*			5	42	19,680	175,813
Gilmore, *Henderson*	1938		9	115	34,310	132,878
Greenbriar, *Henderson*	1943		1	6	3,285	3,285
Hebbardsville			13	70	30,110	157,794
Hitesville, *Union*	1943		12	605	59,130	59,130
Livermore, *McLean*			5	90	34,830	146,706
Morganfield, *Union*	1943		8	290	59,430	59,430
Panther	1943		1			
Poole, *Henderson*	1943		13	405	63,600	63,600
Poole, E., *Webster*	1943		1	16	3,010	3,010
Pratt, *Webster*	1943		5	125	18,130	18,130
Reed, *Henderson*	1939		5	135	29,080	60,286
Robards, *Henderson*	1943		11	280	73,910	73,910
St. Vincent, *Union*	1943		19	3,300	381,240	381,240
Sebree, *Webster*	1940		8	55	19,040	59,269
Smith Mills, *Henderson*	1942		80	8,400	3,278,920	3,529,369
Spottsville, *Henderson*	1938		4	37	16,425	141,621

■ CONTINUED ON PAGE 152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Kentucky—Continued

Field, County	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Spring Grove, *Union*	1941	.....	10	75	38,480	93,752
Thurston, *Daviess*	.....	.....	2	.....	730	20,259
Tilden, *Union*	1942	.....	1	.....	215	640
Uniontown, *Union*	1942	.....	23	405	171,850	187,092
Utley, *Union*	1943	.....	2	35	19,680	19,680
Wabash Island, *Union*	1943	.....	1	.....	1,680	1,680
Wathen, *Union*	1942	.....	8	90	59,770	122,857
Zion, *Henderson*	1943	.....	1	5	12,835	12,835
Total, New Development	....	*9	356	14,906	4,570,870	8,063,898
Old Development	....	.....	13,850	9,300	3,316,635	176,640,465
Total Kentucky	....	*9	14,206	24,206	7,887,505	184,704,363

* Data by fields not here available.

Louisiana Summary

Field, Parish	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
North Louisiana	....	558	4,098	77,787	30,664,254	604,733,382
South Louisiana	....	1,953	2,887	275,300	95,406,147	818,159,771
Total Louisiana	....	2,511	6,985	353,087	126,070,401	1,422,893,153

North Louisiana

Ajax, *DeSoto and Natchitoches*	1941	.....	.....	.....	.....	4,605
Athens, *Winn*	1940	*2	*2	*28	*9,035	*12,235
Bear Creek, *Bienville*	1937	*6	*6	*84	*29,366	*109,497
Beekman, *Morehouse*	1942	*1	*1	*4	*1,362	*2,279
Bellevue, *Bossier*	1921	.....	150	518	192,364	10,796,161
Benson, *DeSoto*	1928	.....	.....	.....	.....	6,494
Big Island, *Rapides*	1942	.....	.....	.....	.....	3,828
Bull Bayou-Naborton, *DeSoto-Red River*	1912	.....	54	493	152,255	57,249,875
Caddo (includes Hosston, Pine Island, Vivian), *Caddo*	1905	.....	1,413	6,604	2,410,255	157,875,157
Calvin, *Winn*	1942	.....	.....	.....	*3,658	*3,876
Carterville-Sarepta, *Bossier-Webster*	1922	.....	23	135	44,367	2,858,055
Catahoula Lake, *LaSalle*	1942	3	4	540	145,121	160,423
Converse, *Sabine*	1932	.....	62	269	96,428	2,508,035
Cotton Valley, *Webster*	1922	7	46	6,278	4,388,208	43,136,076
Crichton, *Winn*	.....	.....	14	187	68,525	68,525
Cypress Bayou, *LaSalle*	1941	1	1	75	21,520	109,018
De Soto, *Winn*	.....	.....	12	94	33,543	33,543
Driscoll, *Bienville*	1936	*4	*4	*10	*4,595	*25,922
Elm Grove, *Bossier-Caddo*	1916	.....	39	282	102,551	3,633,041
Elm Ridge, *LaSalle*	1942	.....	.....	.....	2,727	7,196
Grand Cane, *DeSoto*	9941	.....	2	.....	.....	1,400
Grogan, *DeSoto*	1937	.....	.....	.....	.....	28,671
Haynesville, *Claiborne-Webster*	.....	147	398	14,001	5,458,905	80,506,551
Blossom sand (2500 ft.)	1921	.....	251	2,111	790,996	75,838,642
Pettit lime (5500 ft.)	1941	147	147	11,890	4,667,909	4,667,909
Holly, *DeSoto*	1930	.....	4	84	31,152	1,065,819
Holly Ridge, *Tensas*	1943	2	2	456	37,263	37,263
Homer, *Claiborne*	1919	.....	321	2,910	1,060,117	73,003,298
Indian Bayou, *LaSalle*	1941	1	1	135	46,040	81,435
Lake Bistineau, *Bienville*	1916	*17	*17	*15	*7,295	*32,488
Lake End, *Red River*	1942	.....	.....	.....	.....	407
Lake St. John, *Concordia*	1942	16	17	1,274	332,756	399,768
Larto Lake, *Catahoula*	1941	.....	1	75	27,099	66,253
Lisbon, *Claiborne-Lincoln*	1936	.....	152	2,230	635,597	10,632,890
Little Creek-Zenoria, *La Salle*	1938	4	53	2,909	1,000,477	2,779,087
Logansport-Joaquin, *DeSoto*	1938	*17	*17	*130	*47,585	*119,039
Longwood, *Caddo*	1926	*3	*3	*12	*4,011	*19,476
Lucky, *Bienville*	.....	4	4	3	1,177	1,177
Manifest, *Catahoula*	1942	*1	*1	*3	*956	*1,553
Marston, *Winn*	.....	.....	13	104	38,417	38,417
Monroe Gas Field, *Ouachita, Morehouse-Union*	1916	.....	*	*150	*53,260	*53,260
Nebo-Hemphill, *LaSalle*	1940	71	143	10,520	3,614,455	7,701,545
Nebo, S. *La Salle*	1943	.....	1	9	3,241	3,241
North Carterville, *Bossier*	1942	.....	6	266	83,779	84,806
Oakland, *Union*	1928	.....	.....	.....	4,000	10,393
Olla- S. Olla, *LaSalle*	1940	40	171	9,803	3,846,502	13,620,368
Pleasant Hill, *DeSoto-Sabine*	1927	.....	26	68	24,467	1,519,220
Rodessa, *Caddo*	1930	194	440	8,951	3,494,223	79,307,101
Shongaloo (Deep), *Webster*	1921	.....	.....	.....	1,099	177,772
Shreveport, *Bossier-Caddo*	1913	.....	40	1,781	730,951	6,230,251
Sibley, *Webster*	1936	*6	*6	*27	*18,176	*43,473
Simsboro, *Lincoln*	1935	*2	*2	*11	*6,038	*14,599
Sligo, *Bossier*	1922	.....	111	1,512	618,631	4,027,458

North Louisiana—Continued

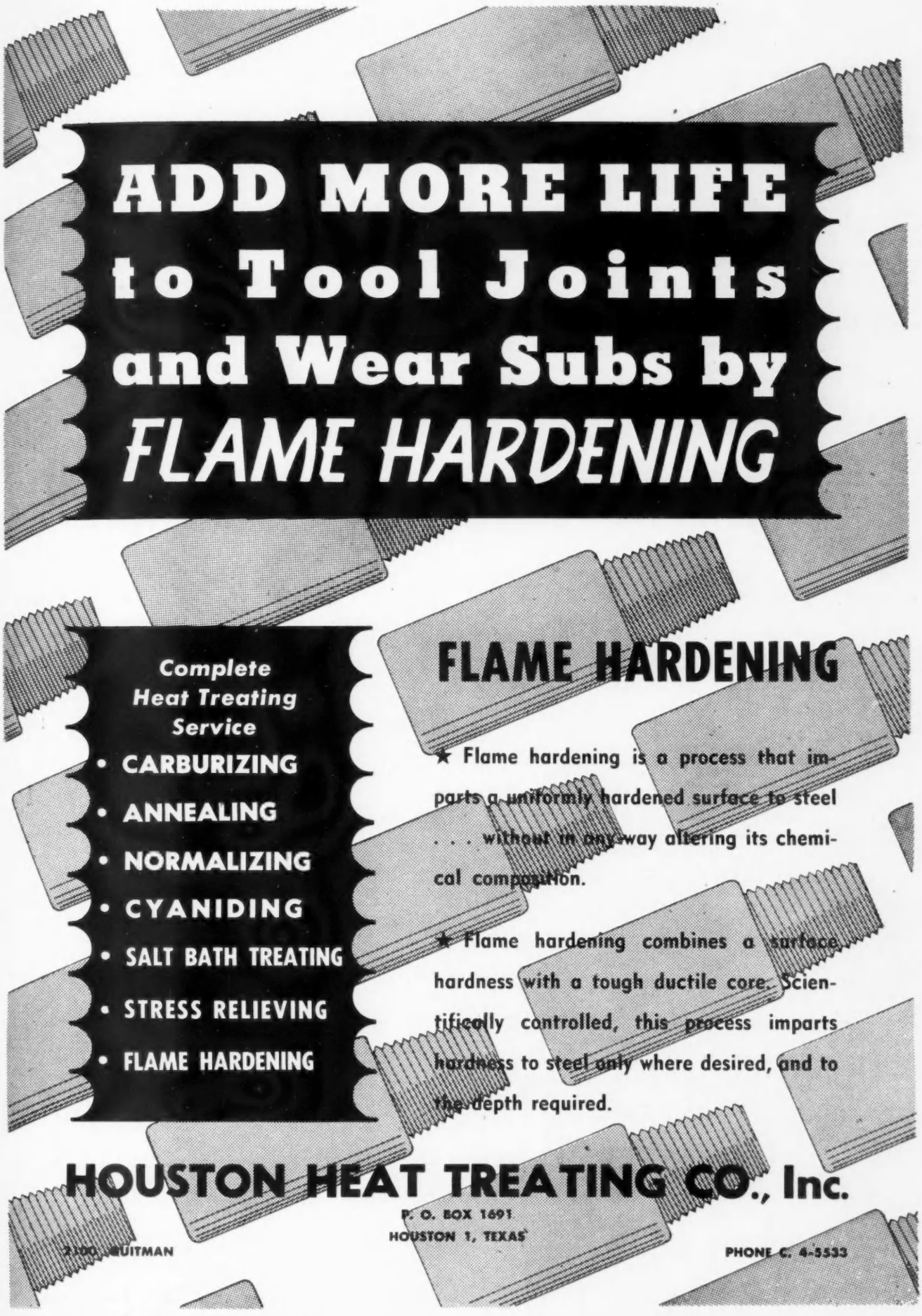
Field, Parish	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
South Jena, *LaSalle*	1941	1	3	175	68,135	261,662
Sugar Creek, *Claiborne*	1930	.....	†39	†1,330	†479,626	†1,972,641
Summerville, *LaSalle*	1940	2	10	300	119,365	364,635
Trout Creek, *LaSalle*	1941	.....	4	126	43,157	163,393
Tullos-Urania-Georgetown, *Grant, LaSalle-Winn*	1925	.....	213	2,035	735,046	26,621,184
Waskom-Bethany, *Caddo*	1924	4	4	11	4,210	33,621
White Sulphur Springs, *LaSalle*	1927	.....	.....	.....	.....	12,290
Willow Lake, *Catahoula*	1941	2	2	270	98,550	200,561
Zwolle, *Sabine*	1928	.....	40	500	182,616	14,891,075
Total North Louisiana	....	†558	†4,098	†77,787	†30,664,254	†604,733,382
	....	‡499	‡4,039	‡77,313	‡30,478,917	‡604,295,685

* Condensate only. † Including condensate. ‡ Excluding above strictly condensate data.

South Louisiana

Abbeville, *Vermilion*	1937	7	7	150	75,820	823,910
Anse La Butte, Shallow, *St. Martin*	1904	1	8	6,100	2,159,447	7,250,582
Anse La Butte, Deep, *St. Martin*	1941	55	57	200	59,185	125,133
Arnaudville, *St. Martin*	1943	1	1	.....	.....	.....
Avery Island, *Iberville*	1942	6	6	950	162,401	184,776
Bancroft, *Beauregard*	1938	4	21	650	224,903	3,317,595
Barataria, *Jefferson*	1939	20	20	3,000	1,118,629	3,638,659
Bastian Bay, *Plaquemines*	1941	.....	.....	.....	19,839	78,834
Bateman Lake, *St. Mary Parish*	1937	14	14	275	95,653	1,157,002
Bay Baptiste, *Terrebonne*	1938	.....	.....	.....	.....	2,309
Bay De Chene, *Jefferson*	1942	1	1	180	63,264	100,349
Bayou Blue, *Iberville*	1929	27	33	2,100	796,056	2,428,378
Bayou Bouillon, *St. Martin*	1916	.....	.....	.....	8,746	568,075
Bayou Choctaw, *Iberville*	1931	2	12	500	165,161	4,038,367
Bayou Couba, *St. Charles*	1942	3	3	200	40,388	43,229
Bayou des Allemands, *St. Charles*	1937	8	10	1,250	313,298	942,740
Bayou Des Glaise, *Iberville*	1940	.....	.....	.....	.....	4,567
Bayou Mallet, *Acadia*	1936	5	5	230	81,218	600,344
Bayou Pigeon, *Iberia*	1940	3	3	325	144,012	727,788
Bayou Sale, *St. Mary*	1941	34	34	6,800	1,894,447	2,974,294
Bay St. Elaine, *Terrebonne*	1937	6	7	325	126,268	948,572
Bear, *Beauregard*	1943	5	5	750	102,384	102,384
Belle Isle, *St. Mary*	1941	.....	.....	.....	1,958	4,831
Big Island, *Rapides*	1942	.....	.....	.....	813	3,449
Big Lake, *Cameron*	1936	1	1	50	5,111	79,944
Black Bayou, *Cameron*	1929	13	22	2,900	1,086,929	10,890,568
Bosco, *Acadia-St. Landry*	1934	28	37	3,000	1,094,662	24,404,915
Branch, *Acadia*	1942	2	2	10	10,536	74,712
Caillou Island, *Terrebonne*	1930	39	51	5,200	1,847,327	34,452,073
Cameron Meadows, *Cameron*	1931	9	31	1,600	670,210	9,886,001
Cankton, *St. Landry*	1937	.....	.....	.....	.....	47,780
Chacahoula, *La Fourche*	1938	19	19	3,000	925,270	2,896,174
Chalkley, *Cameron*	1938	30	30	4,200	1,492,992	5,859,698
Charenton, *St. Mary*	1936	11	135	3,000	1,128,943	10,893,912
Cheneyville, *Rapides*	1935	18	29	2,250	815,462	4,521,656
China, *Jefferson Davis*	1940	.....	.....	.....	.....	7,045
Church Point, *Acadia*	1943	1	1	25	2,010	2,010
Creole, *Cameron*	1938	8	8	550	215,912	2,185,627
Darrow, *Iberville*	1932	15	16	1,300	445,697	5,943,270
Delacroix Island, *Plaquemines*	1941	5	5	500	115,392	162,833
De Large (Dulac), *Terrebonne*	1938	1	1	250	99,348	293,906
Delta Duck Club, *Plaquemines*	1941	1	1	10	3,496	64,262
Delta Farms, *La Fourche*	1940	19	19	3,900	993,142	1,486,901
Dog Lake Bayou, *Terrebonne*	1929	9	10	1,100	442,847	3,199,081
Edgerly, *Calcasieu*	1913	.....	14	125	57,629	8,972,444
Egan, *Acadia*	1943	1	1	25	5,226	5,226
Erath, *Vermilion*	1940	20	20	500	219,012	598,561
Eola, *Avoyelles*	1939	66	86	8,900	3,102,830	15,025,286
Fausse Point, *Iberia Parish*	1927	8	8	900	185,095	324,105
Fields, *Beauregard*	1943	1	1	.....	.....	.....
Four Isles, *Terrebonne*	1934	.....	.....	.....	.....	291,433
Garden Island Bay, *Plaquemines*	1935	31	34	3,800	1,369,104	7,409,068
Gibson, *Terrebonne*	1937	23	24	5,150	1,682,474	7,970,317
Gibson, N.E., *Terrebonne*	1941	14	14	3,200	837,768	1,137,864
Gillis-English Bayou, *Calcasieu*	1934	12	30	1,300	501,942	22,570,103
Golden Meadows, *La Fourche*	1938	71	140	9,000	3,671,593	17,800,616
Grand Bay, *Plaquemines*	1938	39	39	7,600	2,502,763	8,301,447
Grand Lake, *Cameron*	1938	22	22	2,600	959,673	5,335,727
Gueydan, *Vermilion*	1932	19	24	3,650	1,249,275	3,900,071
Hackberry, E., *Cameron*	1927	25	45	4,700	1,727,320	29,691,255
Hackberry, W., *Cameron*	1928	39	71	6,100	1,926,448	13,980,755
Happytown, *St. Martin*	1939	2	2	300	134,149	562,500
Hayes, *Calcasieu*	1942	2	2	6	4,389	12,835
Hester, *St. James*	1943	.....	.....	.....	1,545	1,545
Hope Villa, *E. Baton Rouge*	1943	1	1	50	13,947	13,947
Horse Shoe Bayou, *St. Mary*	1937	11	11	1,200	450,837	2,214,763
Iberia, *Iberia*	1917	46	72	7,800	2,621,792	29,553,451

■ CONTINUED ON PAGE 154



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South Louisiana—Continued

Field, *Parish*	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Iowa, *Calcasieu*	1931	50	61	8,700	2,931,232	51,510,033
Jeanerette, *St. Mary*	1935	11	18	1,600	617,329	11,001,634
Jefferson Island, *Iberia*	1938	5	10	550	277,797	1,408,748
Jennings (Deep), *Acadia*	1937	41	66	8,300	3,327,600	36,420,664
Jennings (Shallow), *Acadia*	1902		32	300	132,232	52,730,562
Kennilworth (Reggio-Shell Beach), *Bernard*	1939	3	3	5	5,221	128,042
Krotz Springs, *St. Landry*	1943	1	1	10	4,840	4,840
La Fitte, *Jefferson*	1935	52	58	13,400	4,689,078	35,275,554
La Fourche Crossing, *La Fourche*	1939	5	5	300	120,399	613,253
Lake Arthur, *Jefferson Davis*	1937	6	6	300	111,562	1,217,893
Lake Barre, *Terrebonne*	1929	5	22	450	161,082	18,119,897
Lake Chicot, *St. Martin*	1941	10	10	1,800	559,673	824,210
Lake de Cade, *Terrebonne*	1942	1	1	25	27,945	41,882
Lake Hermitage, *Plaquemines*	1934		3	2	1,100	160,863
Lake Long, *La Fourche*	1937	11	11	1,400	754,257	3,199,417
Lake Mongouloius, *St. Martin*	1939	3	3	100	41,551	143,201
Lake Palto, *Terrebonne*	1929	11	16	1,450	401,145	3,063,257
Lake Salvador, *Jefferson*	1940	19	19	4,000	1,079,742	2,452,884
Lakeside, *Cameron*	1941					28,466
Lake Washington, *Plaquemines*	1931	7	7	400	147,716	3,351,184
La Pice, *St. James*	1939	3	3	550	169,059	485,504
Lapeyrouse, *Terrebonne*	1941					1,104
La Place, *St. John the Baptist*	1939	3	3	200	73,443	222,147
Leeville, *La Fourche*	1931	19	70	3,700	1,275,961	25,810,432
Lewisburg, *Acadia*	1941	3	3	100	32,227	61,358
Lirette, *Terrebonne*	1937	7	7	500	174,039	448,766
Little Chenier, *Cameron*	1940				217	12,274
Lockport, *Calcasieu*	1924	6	20	700	258,019	16,342,426
Napoleonville, *Assumption*	1943	1	1	50	27,547	27,547
Neale, *Beauregard*	1940	23	28	3,800	1,310,071	3,369,041
Niblett's, *Jefferson Davis*	1940					5,389
North Crowley, *Acadia*	1937	32	38	4,800	1,698,378	8,324,582
North Elton, *Allen*	1939	1	1	50	21,344	65,540
North Jeanerette, *St. Mary*	1943	1	1	150	35,731	35,731
North Ritchie, *Acadia*	1943	2	2	100	12,234	12,234
North Tepetate, *Acadia*	1938	7	7	10	6,966	139,485
Paradis, *St. Charles*	1939	57	57	11,500	4,173,804	7,865,880
Pecan Island, *Vermilion*	1943	1	1	2	1,541	1,541
Pecan Lake, *Cameron*	1941					7,889
Perkins, *Calcasieu*	1943				5,659	5,659
Pine Prairie, (Deep), *Evangeline*	1941	42	42	4,900	1,422,785	2,561,210
Pine Prairie, (Shallow), *Evangeline*	1912					20,000
Plumb Bob, (Henderson), *St. Martin*	1939	2	3	100	72,948	420,313
Pointe Au Fer, *Terrebonne*	1941					202
Port Allen, *W. Baton Rouge*	1941	3	4	400	156,639	420,919
Port Barre, *St. Landry*	1929	23	49	3,600	1,236,729	12,167,139
Potash (Deep), *Plaquemines*	1939	12	15	1,700	689,022	2,339,045
Potash (Shallow), *Plaquemines*	1938					433
Quarantine Bay, *Plaquemines*	1937	39	40	7,450	2,541,396	9,695,934
Rabbit Island, *St. Mary*	1942				331	331
Raceland, *La Fourche*	1938	13	13	2,050	773,998	3,147,288
Reddell, *Evangeline*	1943	2	2			
Richey, *Acadia*	1940	4	12	600	231,855	648,705
Roanoke, *Jefferson Davis*	1934	10	18	1,600	606,281	10,511,982
Rosedale, *Iberville*	1943	1	1	50	1,550	1,550
Sec. 28. Dome, *St. Martin*	1941	2	2	25	13,175	57,792
Shuteston, *St. Landry*	1943	1	1	30	10,476	10,476
Sorrento, *Ascension Parish*	1928	6	6	80	33,772	1,291,018
South Crowley, *Acadia*	1937	1	1	25	11,518	128,477
South Elton, *Jefferson*	1937				645	64,974
South Houma, *Terrebonne*	1938	2	2	140	64,363	637,363
South Jennings, *Jefferson Davis*	1937					144,358
St. Gabriel, *Iberville*	1941	26	27	5,000	1,723,624	3,608,778
St. James, *St. James*	1943	1	1	5	3,453	3,453
St. Martinsville, *St. Martin*	1935	2	2	150	56,345	1,348,629
Starks, *Calcasieu*	1927	3	25	500	196,170	3,632,512
Stella, *Plaquemines*	1940	6	6	600	233,904	634,871
Sulphur, *Calcasieu*	1926	10	64	2,200	713,379	17,445,867
Sweet Lake, *Cameron*	1927	17	17	1,700	625,735	6,811,754
Tepetate, *Acadia*	1935	32	44	2,450	906,816	12,396,575
Thornwell, *Jefferson*	1942	1	1	10	1,849	2,243
Timbalier Bay, *La Fourche*	1938	1	2	45	26,654	267,460
University, *E. Baton Rouge*	1938	37	59	7,000	2,907,789	14,926,017
Unknown Pass, *Orleans*	1941				3,644	12,635
Vacherie, *St. James*	1938	1	1	50	19,756	121,300
Valentine, *La Fourche*	1938	6	18	550	148,660	5,528,815
Venice, *Plaquemines*	1937	28	28	7,300	2,144,270	6,650,402
Vermilion Bay, *Iberia*	1939	3	3	100	108,882	501,548
Ville Platte (Shallow), *Evangeline*	1937	87	110	6,000	2,077,482	15,845,663
Ville Platte (Deep), *Evangeline*	1939	115	134	6,000	2,481,305	9,997,797
Vinton, *Calcasieu*	1910	19	73	2,800	634,595	45,064,696
Welch, *Jefferson Davis*	1903		11	50	16,304	699,365
West Bay, *Plaquemines*	1940	16	16	2,900	895,493	2,063,144
West Cote Blanche Bay, *St. Mary*	1940	14	17	1,900	650,573	1,572,591
West Gueydan, *Vermilion*	1938	6	10	800	259,402	962,233
West Lake Verret, *St. Martin*	1938	14	22	2,700	850,205	2,680,572
West Mermentau, *Jefferson Davis*	1940	3	3	50	18,234	53,432

South Louisiana—Continued

Field, *Parish*	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Westwego, *Jefferson*	1941	4	4	300	116,506	265,481
White Castle, *Iberville*	1929	10	20	3,600	1,284,578	7,421,323
White Lake, E., *Vermilion*	1940	15	15	2,150	548,149	855,976
Woodlawn, *Jefferson Davis*	1938	22	23	2,600	943,180	4,482,363
Total South Louisiana		1,953	*2,887	275,300	95,406,147	818,159,771

* Does not include inactive oil wells or wells classified as gas wells.

Michigan

Field, *County*	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Adams, *Arenac*	1937	12	49	2,830	*980,075	*3,560,969
Adams, South, *Arenac*	1942		4	*	*	*14,343
Aetna-Prosper, *Missaukee*	1942	3	12	700	403,787	406,263
Akron, *Tuscola*	1938		7	90	31,000	159,277
Allegan, *Allegan*	1938		†1	†	†	818
Bangor, *Van Buren*	1939		20	272	94,988	469,688
Bangor, North, *Van Buren*	1942		15	670	171,553	178,069
Beaverton, North, *Gladwin*	1935		11	42	17,923	669,318
Beaverton, South, *Gladwin*	1936		22	253	102,832	456,591
Beaverton, West, *Gladwin*	1943		1	7	900	900
Bentley, *Gladwin*	1937		41	310	147,385	870,922
Birch Run, *Saginaw*	1934		23	18	7,261	206,354
Bloomer, *Montcalm*	1936					814
Bloomingdale, *Van Buren*	1938		90	470	165,590	5,864,549
Bloomfield, *Huron*	1940					71
Blue Lake, *Muskegon*	1941					26
Broomfield, Sherman, *Isabella*	1934					4,058,365
Breedsville, *Van Buren*	1943		9	195	59,552	59,552
Buckeye, *Gladwin*	1936		76	265	89,865	3,881,464
Bushnell, *Montcalm*	1936					4,035
Casco, *Allegan*	1940		3	2	415	4,038
Cass County	1930					1,305
Cedar, *Osceola*	1943	3	8	815	166,753	166,753
Clare City, *Clare*	1938		2	12	4,188	25,464
Clayton, *Arenac*	1936		39	510	181,688	3,834,178
Columbia, *Van Buren*	1938		50	167	65,702	2,029,335
Cranberry Lake, *Clare*	1943		1	27	5,754	5,754
Crystal, *Montcalm*	1935		19	112	48,631	7,256,104
Crystal, *Oceana*	1941					487
Currie, *Isabella*	1936		2	14	4,441	158,660
Dallas, *Clinton*	1942		2	4	371	1,699
Dalton, *Muskegon*	1940		1	2	736	2,929
Decatur, *Van Buren*						38
Deerfield, *Monroe*	1935		19	110	50,904	356,905
Diamond Springs, *Allegan*	1938		21	82	32,167	784,912
Dorr, *Allegan*	1938		17	30	14,113	294,931
East Norwich, *Missaukee*	1942		6	100	22,168	22,168
Edenville, *Midland*	1938		23	80	32,534	1,171,417
Edmore, *Montcalm*	1933		5	30	9,960	442,579
Edwardsburg	1941					38
Evart, *Osceola*	1942	18	28	2,629	981,626	1,179,818
Enterprise, *Missaukee*	1943	1	1		2,200	2,200
Fillmore, *Allegan*	1943		5	50	8,958	8,958
Fork, *Mecosta*	1942	15	38	3,105	780,996	833,928
Foster, *Ogemaw*						418
Freeman, *Clare*	1939		29	260	94,922	2,691,338
Fremont, *Isabella*	1938					2,771
Fremont, *Saginaw*	1937					1,601
Geneva, *Midland*	1935					60,996
Geneva, *Van Buren*	1940		1		2,189	15,109
Gibson, *Bay*	1936					3,573
Goodwell, *Newaygo*	1943	13	18	2,050	288,785	288,785
Gratiot County	1929					228
Grout, *Gladwin*	1940		3	12	3,995	21,916
Hamilton, North, *Clare*	1943	1	1	13	3,149	3,149
Hatton (formerly Hamilton) *Clare*	1940	2	2	300	40,266	57,372
Headquarters, *Roscommon*	1941	20	38	4,290	1,997,994	4,613,646
Holland, *Ottawa*	1940		1		1,785	14,752
Hope, *Barry*	1940		3		2,436	7,504
Hopkins, *Allegan*	1939		4	13	4,763	119,478
Huron, *Wayne*	1943		2		1,095	1,095
Kawkawlin, *Bay*	1938		115	2,030	675,932	1,394,543
Jonesfield, *Saginaw*	1943		1		63	63
Lakefield, *Saginaw*	1937		1		830	6,476
Larkin, *Midland*	1935					6,940
Leaton, *Isabella*	1929		39	35	98,705	3,096,522
Lee, *Allegan*	1941					1,903
Lincoln, *Midland*	1939					71
Marne, *Ottawa*	1940		2		515	2,699
Mason County	1934					228
Mill Lake, *Van Buren*	1938		21	55	21,888	454,803
Monterey, *Allegan*	1938		16	71	26,522	403,693
Monterey Sec. 24, *Allegan*	1938					176
Mount Haley, *Midland*	1935		1	5	1,015	32,324
Mount Pleasant, *Isabella*	1928		154	815	304,848	22,190,923
Muskegon, *Muskegon*	1927		38	70	25,552	6,739,406
Muskrat Lake, *Van Buren*	1941		49	105	44,256	257,896
New Salem, *Allegan*	1938		74	510	233,505	3,532,923
New Holland, *Ottawa*	1943		7	190	44,170	44,170
Niles, *Berrien*	1940					228

■ CONTINUED ON PAGE 156

BIRTH OF AN IDEA

Alsace - 1928

Fifteen years ago in a shallow cable-tool well in Alsace, France, Conrad and Marcel Schlumberger gave expression to an idea that has played a tremendous part in the discovery and economical development of American oil reserves . . . electrical well logging.

As a result of this early experiment, Schlumberger Well Surveying Corporation was organized in 1934 to introduce commercial electrical well logging in the United States. In the ten years since the first "Schlumberger" was made on American soil, the company has completed more than 100,000 electrical well logs in domestic fields, thus lending inestimable aid to the establishment of oil reserves so essential to victory.

THIS IS SCHLUMBERGER'S 10th ANNIVERSARY · 1934 · 1944

Michigan—Continued

Field, County	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
North Buckeye, *Gladwin*	1937		161	960	354,000	15,054,726
North Overisel, *Allegan*	1940		1		293	278,523
Hart, *Oceana*	1932					116,275
West Branch, *Ogemaw*	1933		219	712	283,722	5,173,478
Otisville, *Genesee*	1941		1		351	3,434
Otsego, *Allegan*	1938					134
Overisel, *Allegan*	1938		91	315	128,318	1,904,070
Pine, *Montcalm*	1938		1	12	4,895	38,043
Pine River, *Gratiot*	1942		2	7	3,918	6,867
Polkton, *Ottawa*	1942					246
Porter, *Midland*	1931		229	2,065	745,782	33,311,166
Porter, *Van Buren*	1939		2		807	3,680
Redding, *Clare*	1939		81	1,116	424,732	9,981,962
Reed City, *Osceola*	1940	74	183	16,690	7,726,177	19,584,467
Richfield, *Roscommon*	1941	5	11	200	76,051	147,984
Richland, *Saginaw*	1935					1,871
Riverside, *Missaukee*	1942		1	22	10,742	23,175
Rose City, *Ogemaw*	1943	2	2	75	3,217	3,217
Rose Lake, *Osceola*	1943	9	9	750	74,454	74,454
Saginaw, *Saginaw*	1925		52	50	19,307	1,413,820
Salem, *Allegan*	1937		146	285	105,181	3,046,582
Sauble, *Lake*	1942		5	42	21,686	48,372
Secord, *Gladwin*	1937					12,024
Sherman, *Isabella*	1940		54	315	118,181	119,156
Shiawassee County	1930					236
South Akron, *Tuscola*	1941		2	8	3,709	9,652
South Otsego, *Allegan*	1943		2	5	2,287	2,287
Skeels, *Clare*	1942		1		1,150	1,150
Sumpter, *Wayne*	1942					221
Tallmadge, *Ottawa*	1940					1,647
Tallmadge, South, *Ottawa*	1939		49	160	59,830	357,655
Trowbridge, *Allegan*	1938		41	70	30,386	169,378
Van Horn, *Clare*	1938		‡	‡	‡	873,682
Vernon, *Isabella*	1930		22	202	75,625	4,460,074
Walker, *Kent*	1938		419	1,215	452,165	9,464 243
West Hopkins, *Allegan*	1941		30	80	45,377	355,218
Winfield, *Montcalm*	1936		4	12	3,814	51,282
Winterfield, *Clare*	1940		39	1,553	672,168	3,040,836
Wise, *Isabella*	1938		57	445	172,890	1,901,973
Wisner, *Tuscola*	1936					543
Woodville, *Newaygo*	1943		6	266	59,382	59,382
Woodville, *Newaygo*						3,202
Wyoming Park, *Kent*	1939		14	24	9,615	111,845
Yost-Jasper, *Midland*	1932		81	734	276,803	7,127,039
Zeeland, *Ottawa*	1939					8,617
Zeeland, South, *Ottawa*	1942		8	55	39,150	74,822
Total Michigan		178	3,316	53,270	20,592,361	203,939,418

* South Adams production in 1943 included with Adams. † Shut in.
‡ Van Horn in 1943 included with Freeman and Redding.

Mississippi

Brookhaven, *Lincoln*	1943		1	85	15,850	15,850
Cary, *Sharkey*	1941	2	2	50	25,670	36,170
Cranfield, *Adams*	1943	1	1	150	10,460	10,460
Eucutta, *Wayne*	1943		2	25	2,550	2,550
Flora, *Madison*	1943		2	50	4,850	4,850
*Pickens, *Madison- Yazoo*	1940	7	33	5,950	1,451,300	2,425,150
Tinsley, *Yazoo*	1939	5	332	40,550	17,316,200	65,098,000
Total Mississippi		15	373	46,860	18,826,880	67,593,030

* Pools formerly known as "Vaughn" and "Sharpsburg" have been consolidated with "Pickens" and is now carried as the Pickens pool.

Missouri

Total Missouri	1889		128	217	36,000	*257,000

* Only recorded production, covering less than 20 years; does not include small production in each of about 30 years.

Montana

Border, *Toole*	1930		24	87	28,746	1,125,386
Brady Area, *Pondera*	1943		1	8	720	720
Cat Creek, *Petroleum*	1920		118	322	116,821	15,390,372
Cedar Creek, *Fallon*	1936		‡2	‡	‡	17,588
Cut Bank, *Glacier*	1932		746	14,335	5,302,424	36,833,187
Dry Creek, *Carbon*	1930		7	246	97,821	2,058,599
East Midway, *Pondera*	1943		11	65	19,500	19,500
Elk Basin, *Carbon*	1916		*	*	*	†1,037,482
Frannie, *Carbon*	1940		*	*	*	†52,820
Kevin-Sunburst, *Toole*	1922		1,062	4,786	1,774,229	43,948,213
Lake Basin, *Stillwater*	1924		‡5	‡	‡	479,730
Pondera, *Teton*	1927		151	561	204,955	6,411,783
Sweetgrass Hills, *Toole*	1929		‡5	‡	‡	113,776
Total Montana		8	2,120 ‡‡2,132	20,410	7,545,216	107,489,156

* Included with same field in Wyoming. † Exclusive of 1943 production, which is included in same field in Wyoming. ‡ Shut in. ‡‡ Including 12 wells shut in.

Nebraska

Field, County	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Richardson:						
Barada	1941		15	470	217,900	625,600
Dawson	1940		12	5	2,010	19,810
Falls City	1939		55	1,154	519,800	3,431,800
Shubert	1940		10	6	2,130	104,230
Total Nebraska			92	1,635	741,840	4,181,440

New Mexico Summary

Northwest New Mexico		7	84	1,238	440,378	8,155,558
Southeast New Mexico		2,655	3,796	112,537	38,532,294	375,608,009
Total New Mexico		2.662	3,880	113,775	38,972,672	383,763,567

Northwest New Mexico

Aztec, *San Juan*	1924		1	1	426	32,663
Hogback, *San Juan*	1924	7	7	106	42,484	2,241,760
Hospah, *Mc Kinley*	1926		30	892	308,261	831,560
Rattlesnake, *San Juan*	1924		40	160	58,383	4,513,070
Red Mountain, *Mc Kinley*	1935					5,400
Table Mesa, *San Juan*	1926		6	79	30,824	531,105
Total Northwest New Mexico		7	84	1,238	440,378	8,155,558

Southeast New Mexico

Anderson, *Eddy*	1942	7	20	175	79,534	497,228
Arrowhead, *Lea*	1940	110	111	5,500	1,702,961	5,968,141
Artesia, *Eddy*	1925	1	158	450	175,882	5,900,368
Barber, *Eddy*	1938		15	275	165,945	492,943
Benson, *Eddy*	1943		3	25	7,236	7,236
Black River, *Eddy*	1938					3,509
Brown, *Chaves*						50
Caprock, *Lea*	1941		1		618	2,044
Comanche, *Chaves*	1939		2		320	12,357
Cooper, *Lea*	1934	33	86	2,000	784,512	14,780,758
Corbin, *Lea*	1939	1	2	35	12,883	47,132
Dayton, *Eddy*	1940	8	8	35	16,039	71,933
East Lusk, *Lea*	1942		6	200	79,446	92,039
East Maljamar, *Lea*	1942	5	5	350	34,565	39,999
Eaves, *Lea*	1929	10	24	1,025	340,930	2,778,949
Eunice, *Lea*	1928	407	483	19,100	6,489,010	65,298,482
Fenton, *Eddy*	1943		1	5	760	760
Getty (Twin Hills), *Eddy*	1929		6	250	75,903	544,923
Gravburg-Jackson, *Eddy*	1936	162	221	5,500	1,921,857	13,622,050
Halfway, *Lea*	1940		7	260	91,115	345,907
Hardy, *Lea*	1936	85	119	1,100	425,417	4,933,632
High-Lonesome, *Eddy*	1939		5	4	3,597	27,388
Hobbs, *Lea*	1929	215	251	11,550	3,821,575	104,717,768
Inglefield, *Lea*	1928					2,000
Jal, *Lea*	1928	7	17	475	156,093	6,508,607
Langlie, *Lea*	1935	107	131	2,350	911,194	8,672,126
Leo, *Eddy*	1939	3	7	40	20,235	102,996
Leonard, *Eddy*	1929	35	44	925	265,283	1,172,103
Loco Hills, *Eddy*	1938	142	180	2,950	1,269,286	7,851,427
Lynch, *Lea*	1929		7	300	123,736	7,147,617
Lynn, *Lea*	1929	23	37	1,100	328,293	2,218,535
Maljamar, *Lea*	1926	30	173	4,650	1,738,066	7,411,601
Mattix, *Lea*	1935	121	156	1,850	729,688	7,790,421
McMillan, *Eddy*	1941		1			136
Monument, *Lea*	1935	474	497	21,500	7,183,316	59,394,166
North Lynch, *Lea*	1938		2	18	6,718	171,127
North Maljamar, *Lea*	1939 or 1940		1			3,215
Penrose, *Lea*	1935	141	192	1,500	614,850	8,399,404
Red Lakes, *Eddy*	1924		38	200	74,856	713,845
Rhodes, *Lea*	1928	19	21	530	179,677	691,586
Robinson, *Eddy*	1926	2	13	80	33,089	460,381
Russell, *Eddy*	1942	1	9	175	34,553	39,388
Salt Lake, *Lea*	1941		8	250	82,279	149,522
Shugart (Coulthard), *Eddy*	1938		26	445	176,042	845,823
Skaggs, *Lea*	1937	2	3	55	21,981	166,538
Skelly, *Lea*	1935	33	83	875	328,893	3,398,448
San Simon, *Lea*			1			
South Eunice, *Lea*	1935	77	83	2,975	958,796	6,082,277
South Lovington, *Lea*	1939	35	43	1,725	602,376	2,233,005
South Maljamar, *Lea*	1940	3	5	175	51,529	128,568
Square Lake, *Eddy*	1942	112	116	3,050	1,038,802	1,396,709
Turkey Track, *Eddy*	1943		1	5	1,198	1,198
Vacuum, *Lea*	1928	239	344	15,300	5,011,342	21,437,296
West Eunice, *Lea*	1938	5	19	1,050	313,939	772,605
West Lusk, *Lea*	1942		4	150	46,079	59,743
Total Southeast New Mexico		2,655	3,796	112,537	38,532,294	375,608,009

New York

Field, County	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Total New York	....	.....	22,190	13,000	5,001,000	144,794,000

Ohio

Total Ohio	...	*	†23,350	8,800	3,277,000	598,707,000

* The only flowing wells in Ohio would be possible newly completed wells flowing temporarily.

† Exact count of oil wells at end of 1943 not yet available, but 23,350 regarded as close approximation.

Oklahoma Summary

Central Oklahoma	.....	.....	1,820	19,250	7,762,230	182,567,155
East Central Oklahoma	.....	.....	5,770	7,550	2,959,760	315,429,260
East Central, Creek County	.....	.....	5,705	22,350	7,953,910	790,942,710
Northeastern Oklahoma	.....	.....	14,907	13,100	4,904,700	364,668,392
Northern Oklahoma	.....	.....	1,450	21,250	8,219,050	344,236,141
Oklahoma City Area	.....	.....	1,006	56,990	22,267,313	624,870,334
Osage County Area	.....	.....	7,975	29,850	11,096,380	603,115,217
Seminole Area	.....	.....	4,710	71,250	27,281,700	1,210,732,000
Southeastern Oklahoma	.....	.....	1,700	36,250	10,773,440	151,602,440
Southwestern Oklahoma	.....	.....	7,120	50,100	18,187,450	588,736,450
Total Oklahoma	....	*425	52,163	327,940	121,405,933	5,180,900,099

* Comparatively few flowing wells in Oklahoma estimated to total not over 425, and details by fields not here available.

Central Oklahoma

Field, County	Year of Discovery	Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Chandler, *Lincoln*	1924	.....	43	515	194,850	12,322,450
Davenport, *Lincoln*	1924	.....	114	430	157,440	12,285,740
Davenport, *N. Lincoln*	1941	.....	5	25	9,580	64,180
Evans, *Lincoln*		.....	1	17	8,030	26,730
Kilmers, *Lincoln*	1942	.....	1	5	3,100	6,177
Laffoon, *Lincoln*	1932	.....	12	405	179,275	2,255,375
Mathews, *Lincoln*	1942	.....	1	13	5,475	6,811
Morrow, *Lincoln*	1942	.....	1	.....	.....	176
Sac and Fox, *Lincoln*	1924	.....	140	480	183,020	3,508,420
Sporn, E., *Lincoln*	1942	.....	1	40	6,330	21,330
Wilzetta, *Lincoln*	1934	.....	11	125	49,915	1,392,315
Wilzetta, S., *Lincoln*	1936	.....	5	270	114,367	324,366
Lauderdale, *Pawnee*	1915	.....	183	475	182,590	13,783,790
Skedee, *Pawnee*	1926	.....	7	45	12,925	222,801
Watchorn, E., *Pawnee*	1942	.....	22	2,125	1,004,150	1,435,282
Coyle, *Payne*	1938	.....	36	3,925	1,632,495	5,807,115
Coyle, N., *Payne*	1942	.....	1	32	15,450	42,050
King, *Payne*	1942	.....	Abn'd.	.....	.....	523
Mehan, N.E., *Payne*	1941	.....	3	58	28,255	91,955
Olinghouse, *Payne*	1942	.....	1	42	21,170	38,443
Orlando, E., *Payne*	1941	.....	3	105	51,250	193,250
Ramsey, *Payne*	1938	.....	41	4,200	1,584,285	8,173,089
Yale-Quay, *Payne*	1914	.....	161	1,590	584,305	23,258,505
Unclassified, C. Oklahoma	....	.....	1,027	4,328	1,733,973	101,306,282
Total C. Oklahoma	....	.....	1,820	19,250	7,762,230	186,567,155

East Central Oklahoma

Field, County	Year of Discovery	Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Brown, *Okfuskee*	1942	.....	2	8	3,040	5,693
Clearview, N.W., *Okfuskee*	1942	.....	1	.....	335	* 1,482
Hensley, *Okfuskee*	1942	.....	1	5	1,215	3,815
Midwest, *Okfuskee*	1942	.....	4	175	53,050	79,350
Okemah, N., *Okfuskee*	1941	.....	11	195	83,460	181,716
Okemah, W., *Okfuskee*	1941	.....	2	10	3,437	47,537
Reed, *Okfuskee*	1942	.....	Abn'd.	.....	.....	1,094
Weleetka, *Okfuskee*	1913	.....	73	425	167,720	6,371,577
Williams, *Okfuskee*	1942	.....	Abn'd.	.....	.....	224
Bald Hill, *Okmulgee*	1908	.....	755	795	318,645	49,887,294
Morris, *Okmulgee*	1907	.....	219	230	101,255	25,144,121
Pollyanna, *Okmulgee*	1921	.....	196	240	99,430	2,725,530
Bird Creek, *Tulsa*	1906	.....	1,494	905	344,013	71,026,402
Turley, *Tulsa*	1914	.....	348	195	71,325	5,944,125
Conley, *Wagoner*	1942	.....	1	.....	.....	93
Unclassified, E. C. Okla	....	.....	2,663	4,367	1,712,835	154,009,207
Total E. C. Oklahoma	....	.....	5,770	7,550	2,959,760	315,429,260

East Central—Creek County

Field, County	Year of Discovery	Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Bellview, S., *Creek*	1941	.....	6	76	33,150	83,045
Bristow, *Creek*	1916	.....	127	730	274,420	38,078,594
Cushing, *Creek*	1912	.....	1,715	8,150	2,979,040	365,406,756
Depew, *Creek*	1915	.....	71	915	341,184	37,078,484
Glenn, *Creek*	1905	.....	1,775	4,975	1,720,610	223,775,410
Hickory Grove, *Creek*	1942	.....	14	92	29,139	68,072
Mannford, (Deep), *Creek*	1922	.....	5	110	44,135	493,762
Mannford, (Shallow), *Creek*	1937	.....	225	565	207,900	6,085,176
Olive, *Creek*	1914	.....	186	285	110,690	5,081,411
Slick, *Creek*	1913	.....	* 170	1,135	424,680	34,320,190
Wilcox, *Creek*	1919	.....	52	440	158,895	4,153,895
Unclassified	....	.....	1,359	4,877	1,630,067	76,317,915
Total E.C., *Creek*	....	.....	5,705	22,350	7,953,910	790,942,710

Northeastern Oklahoma

Craig, Nowata, Rogers, and Washington	....	.....	14,907	13,100	4,904,700	364,668,392

Northern Oklahoma

Field, County	Year of Discovery	Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Garber, *Garfield*	1916	.....	520	1,640	594,495	56,352,095
Lamont, *Grant*	1937	.....	Abn'd.	.....	7,178	788,873
Braman, *Kay*	1924	.....	23	150	54,535	4,774,543
Braman, N., *Kay*	1924	.....	45	525	189,770	18,637,792
Hubbard, *Kay*	1924	.....	33	350	131,950	8,654,350
Stone, *Kay*	1942	.....	1	3	1,460	3,436
Tonkawa, *Kay*	1921	.....	162	1,210	496,640	122,466,140
Vernon, *Kay*	1925	.....	24	365	139,550	3,602,073
Crescent, *Logan*	1933	.....	48	2,110	765,040	14,969,305
Crescent, S., *Logan*	1942	.....	2	95	21,780	30,366
Guthrie, *Logan*	1941	.....	31	1,040	627,770	2,556,194
Guthrie Townsite, *Logan*	1942	.....	2	165	81,700	125,065
Navina, *Logan*	1941	.....	1	.....	.....	475
Navina, W., *Logan*	1942	.....	8	130	87,690	235,107
Billings (Deep), *Noble*	1935	.....	73	4,325	1,687,670	15,020,797
Billings (Shallow), *Noble*	1917	.....	7	25	10,040	6,219,569
Liberty, *Noble*	1942	.....	3	195	113,850	230,250
Liberty, E., *Noble*	1942	.....	1	290	121,480	170,541
Lucien, *Noble*	1932	.....	119	3,175	1,240,940	31,231,040
Lucien, N., *Noble*	1936	.....	11	305	143,355	1,268,855
Lucien, N.E., *Noble*	1942	.....	5	450	186,240	307,740
Unclassified, N. Oklahoma	....	.....	331	4,702	1,515,917	56,591,535
Total Northern Okla.	....	.....	1,450	21,250	8,219,050	344,236,141

Oklahoma City Area

Field, County	Year of Discovery	Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Moore, *Cleveland*	1935	.....	21	715	268,275	8,924,458
Stella, *Cleveland*	1943	.....	1	60	20,835	20,835
Britton, *Oklahoma*	1935	.....	19	220	93,045	2,619,253
Edmond, *Oklahoma*	1930	.....	77	2,525	954,780	20,034,380
Edmond, N.E., *Oklahoma*	1941	.....	20	425	185,025	297,267
Edmond, W., *Oklahoma*	1943	.....	18	3,000	371,990	371,990
Kune, *Oklahoma*	1941	.....	2	24	12,380	25,580
Oklahoma City, *Oklahoma*	1928	.....	838	49,800	20,274,290	591,718,366
Unclassified, Okla. City Area	....	.....	10	221	86,693	858,205
Total Okla. City Area	....	.....	1,006	56,990	22,267,313	624,870,334

Osage County Area

Field, County	Year of Discovery	Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Atlantic, *Osage*	1924	.....	88	850	296,410	4,879,210
Avant, *Osage*	1904	.....	755	2,075	779,030	95,464,630
Burbank (*Osage and Kay*)	1920	.....	1,693	8,795	3,251,725	211,770,625
Burbank, S., *Osage*	1926	.....	223	7,200	2,641,630	36,144,585
Dalton, S., *Osage*	1941	.....	1	30	12,290	48,990
Flat Rock, *Osage*	1906	.....	578	640	239,105	40,842,605
Naval Reserve, *Osage*	1933	.....	233	2,100	829,250	18,699,099
Osage City, *Osage*	1904	.....	217	525	224,870	53,217,270
Osage Hominy, *Osage*	1917	.....	138	653	239,349	7,328,949
Wildhorse, *Osage*	1912	.....	389	600	229,005	14,469,005
Unclassified, Osage Co. Area	....	.....	3,660	6,382	2,353,716	120,250,249
Total Osage Co. Area	....	.....	7,975	29,850	11,096,380	603,115,217

■ CONTINUED ON PAGE 160

MISSION EQUIPPED
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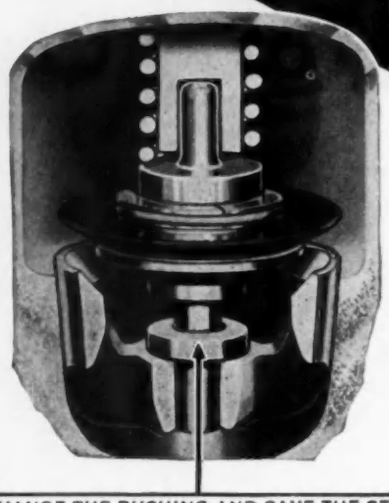
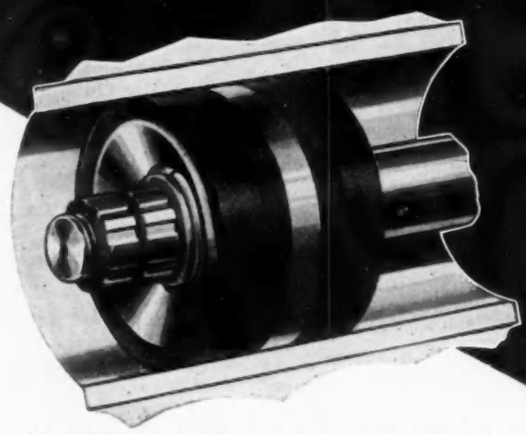


"CHANGE THE BUSHING AND SAVE THE SEAT"



"CHANGE THE RUBBERS AND SAVE THE PISTON"

MISSION SLUSH PUMP VALVES

Replaceable Bushings take the wear instead of the larger, more expensive valve seat—increasing valve seat life many times.

Long usage in every oil country has proved beyond doubt that these valves give better performance.

New inserts (Compound No. 308) last at least twice as long as regular inserts.

Guaranteed to be the most economical valve on the market to operate.

MISSION FLUID END PISTONS

Advanced design and extremely tough rubber compound give Mission Piston Rubbers extra long service.

Then, after a long, uninterrupted run, rubbers are easily replaced at the rig for much less than the cost of a new piston.

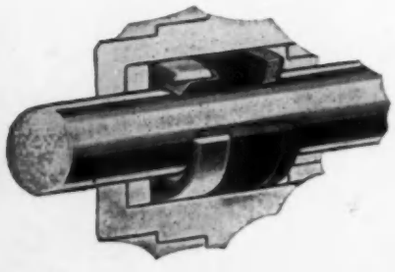
Proved through years of use to give outstanding performance.

MISSION PISTON RODS

The double wearing surface on Mission Super-Surfaced Rods gives at least twice the service of File Hard Rods—and Mission File Hard Rods give better service than any competitive hardened rod.

Their wide use is the best evidence that Mission Piston Rods out-perform and out-run other rods.

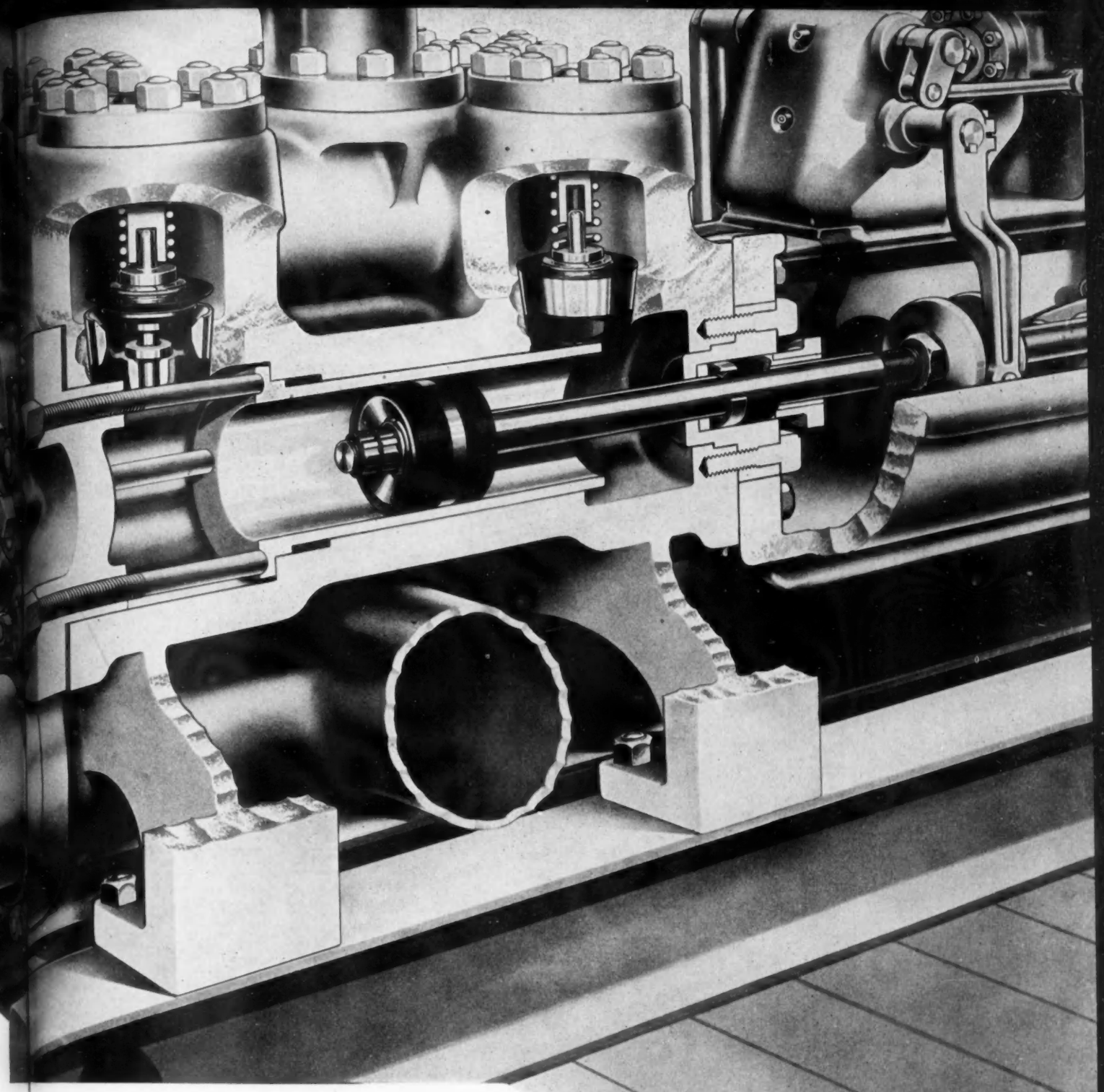
And furthermore, all Mission Piston Rods are guaranteed against breakage.



MISSION SELF-SEALING GLAND PACKING

The self-sealing principle automatically allows pump pressure to adjust packing to the correct tightness—giving perfect sealing while reducing packing and rod wear.

Operators in all the major oil fields have proved beyond doubt that Mission packings outwear and out-perform by far conventional gland packings.



Thousands of operators all over the world have found they get longest uninterrupted runs from their pumps when Mission Slush Pump Parts are used exclusively.

MISSION

MANUFACTURING CO.

HUMBLE ROAD, HOUSTON, TEXAS

EXPORT OFFICE: 30 ROCKEFELLER PLAZA, NEW YORK

Seminole Area

Field, County	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Adams, *Hughes*	1935		10	700	256,625	1,838,020
Fish, *Hughes*	1934		141	1,800	693,895	18,746,195
Hall, *Hughes*	1942		1		710	1,467
Holdenville, W., *Hughes*	1916		107	415	165,590	5,478,690
Papoose, *Hughes*	1923		54	430	162,670	22,201,670
Castle, *Okfuskee*	1941		2	80	37,560	166,160
Castle, N., *Okfuskee*	1941		4	35	15,760	59,960
Castle, S., *Okfuskee*	1941		3	15	5,535	34,335
Cromwell, *Okfuskee*	1923		228	2,400	890,390	58,966,590
Cromwell, E., *Okfuskee*	1940		72	1,975	840,050	3,445,015
Dill, *Okfuskee*	1931		84	620	283,330	5,091,630
Dill, N.E., *Okfuskee*	1943		8	1,250	157,100	157,100
Olympic, *Okfuskee*	1934		315	975	405,940	12,286,140
Rusk, *Okfuskee*	1941		9	625	448,040	1,131,437
Avoca, *Pottawatomie*	1938		17	210	95,925	1,430,625
Brooksville, *Pottawatomie*	1942		9	775	306,680	503,780
Brooksville, S., *Pottawatomie*	1943		1	165	32,300	32,300
Caldwell, *Pottawatomie*	1942		Abn'd.			350
Centerpoint, *Pottawatomie*	1942		4	115	51,590	98,038
Earlsboro, N.W., *Pottawatomie*	1942		8	650	154,640	158,552
Earlsboro, W., *Pottawatomie*	1927		74	915	426,560	3,660,333
Gray, *Pottawatomie*	1932		26	825	302,830	4,989,130
Hallum, *Pottawatomie*	1942		1			390
Hotulke, W., *Pottawatomie*	1941		24	865	390,220	1,452,359
King, W., *Pottawatomie*	1939		1		1,095	231,681
Macomb, *Pottawatomie*	1942		3	63	23,820	51,220
Macomb, S., *Pottawatomie*	1943		2	325	101,900	101,900
Maud, *Pottawatomie*	1928		58	425	160,205	12,428,105
Maud, S., *Pottawatomie*	1941		9	175	71,205	491,505
Prague, *Pottawatomie*	1940		17	475	191,350	1,002,658
Reed, *Pottawatomie*	1942		Abn'd.			458
Romulus, *Pottawatomie*	1940		19	535	176,360	1,414,202
Romulus Townsite, *Pottawatomie*	1942		1	35	16,950	35,550
Shawnee, *Pottawatomie*	1934		48	520	229,190	3,361,892
Shawnee, N., *Pottawatomie*	1937		4	260	102,780	494,894
St. Louis, *Pottawatomie*	1927		748	9,010	3,589,140	163,077,240
St. Louis, E., *Pottawatomie*	1941		8	70	33,340	215,040
St. Louis, N., *Pottawatomie*	1941		30	305	193,850	1,038,576
St. Louis, N.E., *Pottawatomie*	1942		1	5	3,280	5,256
Tecumseh, E., *Pottawatomie*	1941		9	70	33,400	433,600
Tecumseh, Lake, *Pottawatomie*	1941		10	315	140,740	1,083,840
Allen, Deep, *Seminole*	1927		290	3,300	1,241,700	54,027,200
Bethel, *Seminole*	1925		35	130	52,590	1,926,990
Bethel, N., *Seminole*	1936		26	360	210,970	4,286,078
Bowlegs, *Seminole*	1926		200	4,550	1,718,450	122,742,450
Butner, *Seminole*	1942		1			2,555
Carr City, *Seminole*	1927		72	1,610	602,770	32,054,850
Dill, S., *Seminole*	1941		4	78	34,280	173,780
Earlsboro, *Seminole*	1926		165	2,600	991,340	127,589,040
Earlsboro, E., *Seminole*	1929		75	1,200	486,120	39,723,368
Earlsboro, N., *Seminole*	1936		36	2,300	980,940	7,183,819
Earlsboro, S., *Seminole*	1930		26	500	191,900	9,341,600
Fish, W., *Seminole*	1941		1	20	5,810	20,310
Grayson, *Seminole*	1935		32	390	154,120	2,215,620
Grayson, N., *Seminole*	1942		1		1,095	4,647
Grayson, W., *Seminole*	1942		1	9	4,200	11,613
Harjo, *Seminole*	1941		2	10	7,300	18,100
Homestake, *Seminole*	1941		1	11	1,240	3,814
Keokuk, *Seminole*	1933		90	1,750	682,150	13,281,450
Konawa, *Seminole*	1929		92	805	307,330	15,835,130
Konawa, S., *Seminole*	1938		46	330	142,930	1,383,873
Little River, *Seminole*	1927		216	4,100	1,552,165	115,150,465
Little River, E., *Seminole*	1928		62	425	166,320	17,065,420
Little River, N., *Seminole*	1941		5	275	125,380	421,380
Little River, W., *Seminole*	1938		13	215	84,980	1,021,380
Mission, *Seminole*	1928		57	860	319,345	26,178,506
Osborn, *Seminole*	1942		Abn'd.		511	1,035
Rosanna, *Seminole*	1924		20	150	63,970	1,745,475
Sasakwa, *Seminole*	1927		58	715	268,790	11,439,190
Searight, *Seminole*	1926		56	765	297,630	34,890,630
Seminole City, *Seminole*	1926		192	4,750	1,815,180	132,638,380
Seminole, E., *Seminole*	1926		85	650	245,490	9,058,890
Seminole, W., *Seminole*	1935		35	1,275	482,561	14,277,661
Shepard, *Seminole*	1941		1			3,823
Sylvian, *Seminole*	1941		7	315	103,390	140,790
Sylvian, N.E., *Seminole*	1942		2	30	15,850	31,065
Trapp, *Seminole*	1942		1	6	2,372	3,113
Traugh Deep, *Seminole*	1937		10	106	50,580	985,265
Traugh Shallow, *Seminole*	1937		24	180	70,415	987,468
Wewoka, *Seminole*	1923		80	685	292,580	34,645,246
Wewoka Townsite, *Seminole*	1924		25	290	113,670	6,225,982
Unclassified, Seminole Area			397	7,077	2,200,741	44,596,666
Total Seminole Area			4,710	71,250	27,281,700	1,210,732,000

Southeastern Oklahoma

Field, County	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Ardmore, *Carter* (east half)	1942		2	205	72,450	85,100
Brock, *Carter* (east half)			127	230	85,840	3,708,390
Caddo, N., *Carter* (east half)	1942		1	150	98,820	154,220
Centrahoma, *Coal*	1937		3	45	18,830	126,530
Pauls Valley, *Garvin*	1942		50	12,000	2,044,730	2,848,098
Cumberland, *Marshall*	1940		86	12,700	3,790,620	9,327,170
Bebee, *Pontotoc*	1923		214	2,425	929,350	14,034,250
Fitts, *Ponotoc*	1933		650	6,150	2,373,020	98,483,670
Jesse, *Ponotoc*	1935		56	1,675	618,680	6,234,030
Roper, *Ponotoc*	1942		5	180	84,860	104,320
Unclassified, S.E. Okla			506	490	656,240	16,496,662
Total S.E. Oklahoma			1,700	36,250	10 773,440	151,602,440

Southwestern Oklahoma

Field, County	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Apache, *Caddo*	1941		29	6,350	2,297,100	4,215,066
Cement, *Caddo*	1917		364	7,850	2,526,440	28,675,300
Fox (Old Prod. and deep), *Carter* (west half)	1917		94	700	260,450	15,150,750
Healdton, *Carter* (west half)	1913		1,873	7,075	2,623,100	195,999,600
Hewitt, *Carter* (west half)	1919		907	6,000	2,377,340	98,215,050
Sholem Alechem, *Carter* (west half)	1923		300	2,100	795,370	39,523,770
Tatums, *Carter* (west half)	1927		209	1,750	617,975	17,366,075
Tussy, *Carter* (west half)	1933		108	2,250	868,060	6,313,960
Walters, *Cotton*	1917		221	690	260,305	25,978,105
Robberson, *Garvin*	1921		166	725	285,155	15,744,682
Knox, *Grady*	1924		175	1,300	493,270	16,047,670
Altus, *Jackson*	1934		111	450	173,070	1,947,070
Tipton, *Jackson*	1935		57	340	132,465	1,972,865
Oscar, *Jefferson*	1924		191	1,025	384,345	11,017,345
Comanche, *Stephens*	1918		143	380	141,380	10,696,331
Empire, *Stephens*	1920		266	1,595	642,770	15,430,670
Milroy, Deep, *Stephens*	1937		1	300	110,470	646,920
Milroy, Shallow, *Stephens*	1916		142	270	100,100	3,558,450
Peck, *Stephens*	1942		6	115	17,155	20,398
Velma, *Stephens*	1917		662	1,830	609,980	7,167,491
Woolsey, S. *Stephens*	1942		8	94	42,100	82,639
Fredrick, *Tillman*	1937		3	12	5,505	37,039
Fredrick, W. *Tillman*	1937		29	950	369,260	3,109,450
Unclassified, S.W. Oklahoma			1,055	5,949	2,054,285	69,789,534
Total S.W. Oklahoma			7,120	50,100	18,187,450	588,736,450

Pennsylvania

Total Pennsylvania			85,000	40,200	15,641,000	1,036,828,000

Tennessee

Clay, Fentress, Morgan, Pickett, Scott			28	33	12,000	436,000

Texas Summary

East Texas Field		16,292	24,672	364,265	128,484,941	1,969,319,314
Rest of Eastern Texas		1,196	3,913	112,590	42,713,213	615,202,356
North Texas		1,765	19,407	117,152	41,507,457	816,929,350
West Texas		7,898	15,486	354,628	98,529,695	1,378,065,365
West Central Texas		484	6,852	26,129	8,946,821	389,962,416
Texas Panhandle		36	5,678	94,400	33,464,648	473,853,682
Gulf Coast, Upper		6,064	8,999	517,480	151,440,392	1,670,995,691
Gulf Coast, Lower		3,025	4,378	190,556	53,178,181	401,432,434
Southwest Texas		1,022	5,890	80,600	23,270,743	270,983,887
South Central Texas		49	3,177	20,390	6,460,888	229,014,313
Total Texas		37,831	98,452	1,878,190	587,996,979	8,215,758,808

East Texas Field

East Texas Field, *Rusk, Gregg, Upshur, Smith and Cherokee*	1930	16,292	24,672	364,265	128,484,941	1,969,319,314

Eastern Texas Except East Texas Field

Bazette, *Henderson*	1939		8	150	51,615	271,940
Beulah, *Angelina*	1938					33,548
Boggy Creek, *Anderson-Cherokee*	1927		15	165	60,128	5,172,048
Buffalo, *Leon*	1938					1,123
Campbell, *Hunt*	1943		2	200	25,082	25,082
Camp Hill, *Anderson*	1935					293,000
Cayuga, *Anderson-Henderson*	1934	105	268	9,070	3,383,864	29,659,493
Cayuga, (Trinity Sand), *Anderson*	1939	1	1	15	5,434	26,642
Cedar Creek, *Limestone*	1927					298,000
Chapel Hill, *Smith*	1940	40	46	1,808	691,144	2,406,139
Coke, *Wood*	1942	26	29	2,305	486,780	525,402

■ CONTINUED ON PAGE 162

THE CORROSION CONDITIONS:
Mild Solutions at Temperatures to 1100° F.
THE APPROVED STEEL CASTINGS ALLOY:
Lebanon CIRCLE L 10

LEBANON Ⓛ 10 is the "standout" for handling moderately corrosive solutions over a broad range of applications and at temperatures to 1100° F. Strength and yield point are notably high . . . creep is exceptionally low.

This alloy may be welded by the electric arc or the acetylene method with welding rod of similar basic composition.

Lebanon Ⓛ 10 is recommended for heat exchangers, return bends, flow line headers, flow line header plugs, flow line header yokes, flanges, pipe fittings, valve bodies, valve trim, oil pump impellors, oil pump diffuser rings, oil pump casings and condenser fittings.

For its intended functions, Lebanon Ⓛ 10 is an ever dependable specification. Find out where and how it fits into your picture . . . write today for further information.

LEBANON STEEL FOUNDRY, LEBANON, PA.

ORIGINAL AMERICAN LICENSEE GEORGE FISCHER (SWISS CHAMOTTE) METHOD

LEBANON Ⓛ 10

ANALYSIS Carbon .30 Max. Chromium 4.00 to 6.50 Molybdenum .40 to .65

MINIMUM PHYSICAL PROPERTIES

(Room Temperature)

Tensile Strength, PSI	90000
Yield Point, PSI	60000
Elongation in 2"	18%
Reduction of Area	30%
Brinell Hardness	175
Bend Test (when required)	90%

ALLOWABLE STRESS VALUES*

(Castings for Pressure Piping)

Temperature	Oil, PSI	Power, PSI
650° F	15500	12000
700° F	15250	12000
800° F	14750	11800
900° F	12500	10000
1000° F	7300	5850
1100° F	2750	

*American Standards Association, 1942

LEBANON CIRCLE L *Stainless and Special Alloy* **STEEL CASTINGS**

Eastern Texas Except East Texas Field—Continued

Field, County	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Concord, *Anderson*	1942		1	21	3,551	12,510
Corsicana, *Navarro*	1895		588	365	130,018	16,927,653
Currie, *Navarro*	1921		14	95	35,648	6,960,373
Flag Lake, *Henderson*	1937		9	110	37,267	552,441
Ginther, *Angelina*	1937	4	4	14	4,988	7,988
Grapeland, *Houston*	1938				400	134,190
Groesbeck, *Limestone*	1942				751	2,710
Hawkins, *Wood*	1940	371	391	19,000	13,859,623	20,797,816
Henderson, *Rusk*	1943			75	10,658	10,658
Huntington, *Angelina*	1938		1	3	724	10,241
Kildare, *Cass*	1942	25	28	2,470	565,881	699,605
Larissa, *Cherokee*	1942	1	1	30	11,396	13,279
Long Lake, *Anderson*	1933	114	135	4,350	1,360,076	7,410,655
Long Lake, East, *Anderson*	1941	10	12	432	143,369	326,696
Lott, *Falls*	1937					32,240
Mabank (Rowe and Baker), *Henderson*	1939				1,357	85,029
Manziel, *Wood*	1943	3	6	482	84,210	84,210
Mexia, *Limestone*	1916		203	1,410	515,305	98,951,957
Nacogdoches, *Nacogdoches*	1865		38	4	2,968	332,631
Navarro Crossing, *Houston*	1938	18	21	234	89,669	804,938
New Hope, *Franklin*	1943	6	6	890	128,483	128,483
Nigger Creek, *Limestone*	1926					3,012,093
Oakwood, *Leon*	1939					14,331
Opelika, *Henderson*	1937					33,259
Panola (Bethany), *Panola*	1938		4	18	6,554	58,425
Percilla, *Houston*	1937					30,380
Pickering (Ashton), *Shelby*	1942					1,004
Pittsburg, *Camp*	1940	2	6	451	139,430	283,054
Pleasant Grove, *Rusk*	1941	3	7	198	69,140	148,488
Pleasant Grove (Shallow), *Rusk*	1942		1	20	7,504	17,273
Ponta (Lone Star), *Cherokee*	1939		1	60	21,790	63,607
Post Oak, *Falls*	1937					3,565
Potter (W. Edge Caddo) *Marion*	1910		48	207	81,891	527,134
Powell, *Navarro*	1900		152	1,400	509,588	116,366,755
Quitman, *Wood*	1942	34	36	3,680	597,105	599,988
Redland (Davisville), *Angelina*	1939					60
Rice, *Navarro*	1938					64
Richland, *Navarro*	1924		4	30	9,043	6,687,839
Rodessa, *Cass*	1935	85	351	5,200	2,232,028	53,590,970
Rusk, *Cherokee*	1934					268,264
Sadler	1943		1	25	3,832	3,832
Satin, *Falls*	1938					140
Shelbyville, *Shelby*	1917	1	2	5	1,772	4,152
South Bosque, *McLennan*	1902		28	8	3,450	21,986
Sulphur Bluff, *Hopkins*	1936		73	4,117	1,515,976	11,037,014
Tacoma, *Panola*	1934					20,220
Talco, *Titus-Franklin*	1936	14	730	25,560	9,317,103	67,368,974
Tehuacana, *Limestone*	1940		3	26	8,444	47,741
Tri-Cities, *Henderson*	1943	1	1	57	20,499	20,499
Van, *Van Zandt*	1929	329	559	27,000	6,194,320	138,273,874
Van, Shallow, *Van Zandt*	1933		27	65	22,098	348,430
Waskom, *Harrison*	1938	1	17	35	12,768	99,133
Wieland (Club Lake), *Hunt*	1942	2	6	347	112,315	131,202
Willow Springs, *Gregg*	1938					32,139
Wortham, *Freestone-Limestone*	1916		29	383	136,174	23,087,747
Total Eastern Texas Except East Texas Field	....	1,196	3,913	112,590	42,713,213	615,202,356

Texas Gulf Coast, Upper

Field, County	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Abel Borden (Mackey), *Wharton*	1940				2,397	48,304
Ace, Deep (Schwab-Wilcox), *Polk*	1939	4	5	193	68,419	396,699
Ace, Shallow (Schwab), *Polk*	1934					150,728
Aldine, *Harris*	1939	2	2	149	31,721	109,632
Aldine, West, *Harris*	1942					3,872
Alief, *Harris*	1942	1	1	12	1,967	2,051
Allen, *Brazoria*	1927					90,008
Alta Loma, *Galveston*	1940	6	6	500	176,606	698,507
Amelia, *Jefferson*	1936	104	104	4,673	1,670,652	8,760,892
Anahuac, *Chambers*	1935	349	353	30,207	8,901,737	32,570,320
Angleton, *Brazoria*	1939	1	1	3	1,257	635,192
Armour (McCrosky), *Matagorda*	1938	1	2	25	10,254	174,426
Arriola, *Hardin*	1932		12	375	113,980	2,432,227
Bailey's Prairie, *Brazoria*	1940					1,766
Bammel (Aldine), *Harris*	1937	1	1	109	40,000	958,783
Barbers Hill, *Chambers*	1916	21	125	6,000	2,343,308	79,321,872
Batson, Shallow (Old), *Hardin*	1903	1	8	360	131,393	38,371,076
Batson, Deep (New) *Hardin*	1934		151	250	93,636	2,368,012
Bay City, North, *Matagorda*	1942	5	6	500	145,569	166,450
Big Creek, *Fort Bend*	....		15	700	180,133	10,326,736
Big Hill, *Jefferson*						14,000
Big Hill, Deep, *Jefferson*	1942					98
Big Hill, *Matagorda*	1904					211,000
Bland, *Orange*	1941				1,052	20,472
Blessing, *Matagorda*	1940					25,358
Blue Ridge, *Fort Bend*	1919	6	47	525	193,027	12,195,529

Texas Gulf Coast, Upper—Continued

Field, County	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Boling, *Wharton-Fort Bend*	1925	12	48	1,156	384,344	8,270,881
Brenham, *Washington*	1915		6	7	2,401	388,425
Brookshire (San Felipe), *Waller-Austin*	1934					22,420
Brushy Creek, *Lavaca*	1941					5,621
Buckeye, *Matagorda*	1932		1	10	4,128	832,491
Buckeye, South, *Matagorda*	1942	2	2	110	40,377	41,856
Buck Snag, *Colorado*	1942	1	1	79	13,432	13,598
Buttermilk Slough, *Matagorda*	1939					10,774
Call, *Newton*	1937					11,415
Camp Eleven, *Tyler*	1942	2	2	319	90,242	166,290
Caplen, *Galveston*	1939	14	14	1,000	308,912	817,754
Ceda Bayou, *Chambers*	1938		1	1	1,802	23,035
Cedar Point, *Chambers*	1938	17	17	2,272	649,129	1,910,394
Cheek, North, *Jefferson*	1937					72,810
Chenango, *Brazoria*	1941	1	1	54	17,506	75,366
Chocolate Bayou, *Brazoria*	1939	2	2	236	77,848	414,344
Cistern, *Fayette*	1943	1	1	25	2,019	2,019
Clam Lake (McFaddin), *Jefferson*	1937	10	14	1,133	201,642	617,855
Clay Creek, *Washington*	1928	3	48	767	22,245	4,768,517
Clear Lake, *Harris*	1938	37	38	5,750	1,443,127	3,252,194
Cleveland, *Liberty*	1933	1	8	190	79,010	1,532,269
Clinton (Green's Bayou), *Harris*	1936	5	7	114	39,953	357,731
Clodine, *Fort Bend*	1941	21	21	1,028	282,047	501,483
Collier, *Jackson*	1942	3	3	150	36,212	36,212
Conroe, *Montgomery*	1931	829	917	63,202	19,957,155	161,943,397
Conroe, West, *Montgomery*	1941	1	1	25	8,642	22,833
Cordele, *Jackson*	1938	29	44	980	270,149	2,632,508
Cotton Lake, *Chambers*	1936	2	8	267	86,942	932,110
Cotton Lake, South, *Chambers*	1937	14	34	1,205	444,202	3,224,802
Cottonwood	1943	1	1	25	2,261	2,261
Damon Mound, *Brazoria*	1916		27	190	70,477	9,874,265
Danbury, Shallow, *Brazoria*	1934	3	14	450	171,289	905,253
Danbury, Deep, *Brazoria*	1942	5	5	520	168,424	184,560
Dickinson, *Galveston*	1934	40	65	1,570	578,956	8,557,020
Dyersdale, *Harris*	1940	39	49	1,765	605,155	1,392,147
East Bernard, *Wharton*	1940					1,211
Edna, *Jackson*	1937					5,172
Elm Bayou, *Chambers*	1942					1,703
Esperson, *Liberty*	1929	24	62	1,610	608,662	7,994,531
Esperson, South, *Liberty*	1939	23	23	650	211,935	1,306,361
Eureka, *Harris*	1934	8	23	1,366	491,392	3,877,195
Fairbanks, *Harris*	1938	275	291	7,975	2,716,712	13,966,562
Fannett, *Jefferson*	1927	24	36	4,602	1,240,008	4,875,342
Fig Ridge, *Chambers*	1940	24	24	3,539	840,272	1,128,768
Fisher's Reef, *Chambers*	1940	2	2	90	32,989	91,235
Fostoria, *Montgomery*	1942		1	5	2,327	7,501
Francitas, *Jackson*	1938	11	11	225	29,164	411,245
Fred, *Tyler*	1941	3	3	185	49,441	88,309
Friendswood (Webster), *Harris*	1937	212	214	56,800	11,456,732	24,070,747
Ganado, Shallow, *Jackson*	1937	1	6	110	46,340	284,537
Ganado, Deep, *Jackson*	1941	33	33	1,049	350,106	678,465
Garwood, *Colorado*	1932					6,198
Garwood, West, *Colorado*	1941	3	3	80	29,073	111,239
Gillock, *Galveston*	1935	69	88	3,406	1,222,506	9,591,350
Goodrich, *Polk*	1941		3	50	21,332	57,449
Goose Creek, *Harris*	1907		83	989	381,281	79,240,724
Green Lake, *Galveston*	1936	1	1	70	21,778	125,491
Hamman (Bay City), *Matagorda*	1936	4	20	1,448	516,058	4,307,432
Hampton, *Hardin*	1942	1	1	40	14,911	26,661
Hankamer, *Liberty*	1929	4	26	688	176,739	5,852,825
Hankamer, New, *Liberty*	1934	4	6	225	83,199	821,531
Hardin, *Liberty*	1935	69	137	3,366	1,362,209	9,938,671
Harmon, *Jackson*	1942	10	15	536	184,530	300,086
Hastings, *Brazoria*	1934	667	689	59,700	18,003,529	63,544,941
Hawkinsville, *Matagorda*	1936					2,000
High Island, *Galveston*	1922	16	56	2,046	800,547	19,676,096
Hillje, *Wharton*	1939	8	15	475	168,353	668,082
Hitchcock, *Galveston*	1937	9	13	475	181,369	1,207,104
Hockley, *Harris*	1923					16,000
Hoskins Mound, *Brazoria*	1906					32,000
Hull, *Liberty*	1918	10	171	5,136	1,886,343	97,952,134
Humble, *Harris*	1904	9	230	2,260	797,334	128,362,904
Humble Deep	1928	5	37	960	292,183	13,713,395
Humble Shallow	1904	4	193	1,300	505,151	114,649,509
Joe's Lake (Spurger), *Tyler*	1937	32	41	1,568	543,895	3,829,230
Joyce Richardson (Ogburn) 6500 ft. sand, *Harris*	1940	1	1	53	13,860	62,667
Joyce Richardson (Ogburn), 6900 ft. sand, *Harris*	1941	1	1	90	30,040	65,363
Katy, *Waller*	1938					299,350
Kirby, *Liberty*	1943	3	3	200	60,843	60,843
Kubela, *Wharton*	1936	6	18	500	190,793	1,526,384
LaBelle, *Jefferson*	1937	4	5	667	154,042	797,523
Lake Creek, *Montgomery*	1941					190,835
League City, *Galveston*	1938	31	34	2,435	776,383	3,081,283
Lissie, *Wharton*	1940					1,014
Little Kentucky, *Jackson*	1943	1	1	50	2,655	2,655
Livingston, *Polk*	1930	4	70	1,310	506,758	7,764,961
Livingston, Sparta Sand, *Polk*	1942	1	1	64	26,933	35,599
Livingston, Wilcox Sand, *Polk*	1942		1	38	14,943	27,838
Lochridge, *Brazoria*	1937	29	39	1,700	659,997	4,545,952
Lolita, *Jackson*	1940	173	175	5,386	1,886,416	5,835,338
Lost Lake, *Chambers*	1929		1	3	683	1,038,118
Louise, *Wharton*	1933	5	36	1,086	406,312	4,260,516

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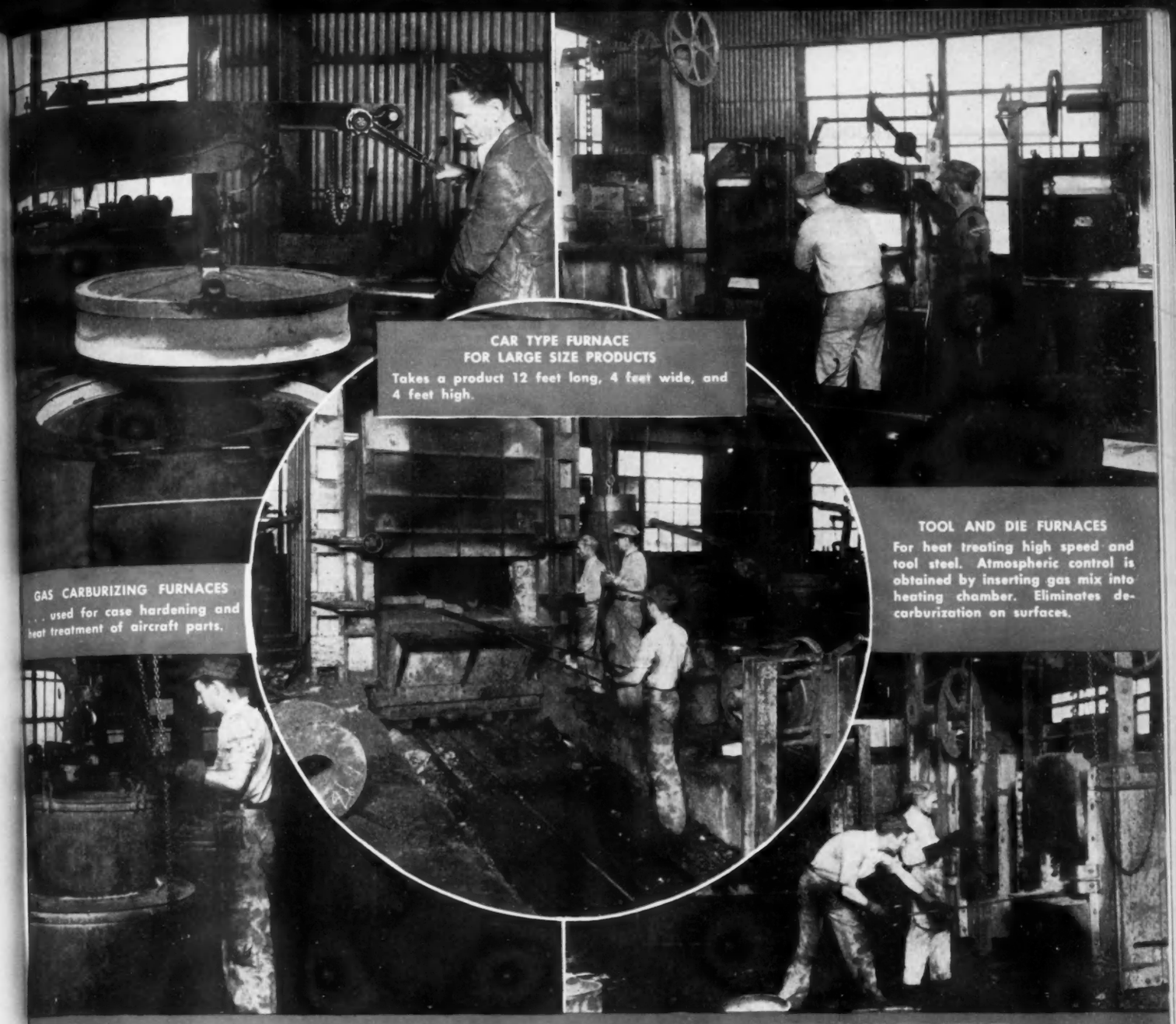

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MTI MASTER CRAFTSMEN

METAL TREATING INSTITUTE

Texas Gulf Coast, Upper—Continued

Field, County	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Lovell's Lake (Cheek), *Jefferson*	1938	99	99	4,923	2,050,693	6,337,483
Lucky, *Matagorda*	1941	3	3	245	68,509	123,134
Magnet-Withers, *Wharton*	1936	216	261	8,638	3,254,909	15,448,337
Magnolia, *Montgomery*	1941					1,682
Manvel, *Brazoria*	1931	94	163	7,464	2,665,524	25,909,132
Markham, *Matagorda*		11	40	1,080	259,204	8,944,627
Markham, N., *Matagorda*	1938	1	1		1,271	35,838
Markham, N., Carlson, *Matagorda*	1941	2	2	405	36,821	75,420
Markham, N., Cornelius, *Matagorda*		28	28	3,548	483,950	872,815
Martha, *Liberty*	1939	5	12	516	196,371	653,034
Maurbro, *Jackson*	1941	62	66	1,493	403,367	1,112,577
Mauritz (Ganado), *Jackson*	1936	8	8	450	106,118	682,491
Mayo, *Jackson*	1942	33	35	1,297	329,655	429,275
Mercy, *San Jacinto*	1942	37	37	3,017	898,385	1,069,896
Moore (Orchard), *Fort Bend*	1926	3	9	150	38,428	4,084,600
Moss Bluff, *Liberty-Chambers*	1930					179,000
Mustang Creek, *Jackson*	1942				1,007	1,007
Mykawa, *Harris*	1930		9	45	17,559	979,023
Mykawa, New, *Harris*			20	338	121,669	3,786,616
Nash, *Fort Bend*	1926					1,664,811
Needville, *Fort Bend*	1942	3	3	45	24,657	63,763
Nome, *Jefferson*	1936	17	38	1,837	640,365	3,521,635
North Dayton, *Liberty*	1905				1,200	2,374,171
North Houston, *Harris*	1939	4	4	126	43,659	341,013
North Katy, *Waller*	1943	5	5	272	58,152	58,152
North La Ward, *Jackson*	1941	91	95	2,350	742,545	1,319,160
North Withers, *Wharton*		118	121	8,740	2,731,709	4,577,002
Old Ocean, *Brazoria*	1934	117	118	14,000	4,830,749	23,397,627
Orange, *Orange*	1913		35	245	106,987	33,171,227
Oyster Bayou, *Chambers*	1941	19	19	5,500	1,213,856	1,389,142
Palacios, *Matagorda*	1937	1	1	8	2,535	151,044
Pickett Ridge, *Wharton*	1935	16	46	1,500	530,548	3,878,551
Pierce Junction, *Harris*	1921	11	64	1,322	491,207	36,127,413
Pinehurst, *Montgomery*	1943	1	1	150	32,904	32,904
Pledger, *Brazoria*	1932					17,000
Port Neches, *Orange*	1929	1	14	445	146,736	5,672,674
Port Neches, West, *Orange*	1939	15	26	1,223	377,317	1,181,236
Provident City, *Lavaca*	1942					2,856
Raccoon Bend, *Austin-Waller*	1927	57	157	10,180	2,647,351	28,076,887
Raccoon Bend, Deep	1934	57	83	8,850	2,164,186	9,282,151
Raccoon Bend, Shallow	1927		74	1,330	483,165	18,794,736
Red Fish Reef, *Chambers*	1940	15	15	1,978	600,575	1,289,382
Rockland, *Jasper*	1928					43,704
Rosenberg, *Fort Bend*	1939					22,307
Rosslyn, *Harris*	1938	1	1	1	476	48,346
Rowan, *Brazoria*	1940	7	7	758	164,276	574,769
Sabine Pass, *Jefferson*	1941					10,218
Sandy Point, *Brazoria*	1937		3	90	33,544	346,200
Saratoga, *Hardin*	1901		214	639	233,440	30,215,270
Satsuma (Fairbanks), *Harris*	1936	6	10	453	143,911	820,960
Seabreeze, *Chambers*	1936	11	11	1,756	390,462	1,088,336
Segno, Deep, *Polk*	1938	63	71	3,824	1,266,607	5,066,116
Segno, Shallow, *Polk*	1936	24	37	910	334,442	3,086,520
Shepherd, *San Jacinto*	1940					24,442
Sheppards Mott, *Matagorda*	1936					1,000
Sheridan, *Colorado*	1940	3	3	231	85,388	250,385
Silsbee, *Hardin*	1936	21	40	1,862	668,649	3,978,850
Silsbee, West, *Hardin*	1941	2	2	100	35,688	83,712
Sour Lake, *Hardin*	1893	10	146	1,060	357,795	80,844,649
South China, *Jefferson*	1939	11	15	827	261,555	679,759
South Houston, *Harris*	1935	66	89	5,498	1,603,138	9,032,763
South Liberty, *Liberty*	1925	3	36	304	120,921	16,174,289
Spindletop, *Jefferson*	1901	5	123	933	373,273	127,392,981
Splendora, *Montgomery*	1934					1,000
Spurger, *Tyler*	1940					52,845
Stewart, *Jackson*	1942	6	7	225	74,114	97,576
Stowell, *Jefferson*	1941	43	43	9,905	1,876,718	2,145,631
Stratton Ridge, *Brazoria*	1922					12,000
Sugarland, *Fort Bend*	1928	33	51	9,500	1,836,251	33,097,906
Texana, *Jackson*	1939	1	1	13	4,588	35,811
Thompson, *Fort Bend*	1931	309	341	36,825	10,025,481	58,812,748
Thompson, Shallow, 3600 ft. sand	1931	21	24	1,836	562,538	2,115,444
Thompson, Deep, 5000 ft. and 5400 ft sands	1931	171	198	26,032	6,660,401	48,705,706
Thompson, North, 7800 ft. sand	1939	38	38	1,682	583,809	2,291,462
Thompson, South, 4400 ft and 5400 ft sands	1939	79	81	7,275	2,218,733	5,700,136
Tomball, *Harris-Montgomery*	1933	278	452	9,761	3,239,937	26,151,851
Trinity (Kittrell), *Houston*	1934		15	465	154,119	2,027,238
Turtle Bay, *Chambers*	1935	24	35	1,425	491,078	2,943,238
Turtle Bay, Lotz Sand, *Chambers*	1939	3	3	55	19,873	61,124
Turtle Bay, East, *Chambers*	1943	2	2	200	21,580	21,580
Vanderbilt, *Jackson*	1934					209,916
Van Vleck (Bay City), *Matagorda*	1934	52	53	5,219	1,221,148	6,485,223
Vienna, *Lavaca*	1941					1,496
West Beaumont, *Jefferson*	1936	24	55	1,938	720,221	5,344,815
West Columbia, *Brazoria*	1902	105	144	7,006	2,049,867	93,346,996
West Columbia, Shallow	1902	15	42	2,106	742,616	84,543,716
West Columbia, Deep	1937	90	102	4,900	1,307,251	8,801,280
West Ganado, *Jackson*	1940	34	34	1,507	442,663	863,738
West Mauritz, *Jackson*	1942	13	13	689	236,927	271,808
West Orange, *Orange*	1937	12	44	1,117	432,689	3,400,390
West Ranch, *Jackson*	1938	379	384	24,877	6,826,213	17,882,168
Willow Slough, *Chambers*	1938	7	7	450	148,009	789,552
Wilson Creek, *Matagorda*	1937					193,658
Total Texas Gulf Coast, Upper		6,064	8,999	517,480	151,440,392	1,670,995,691

Texas Gulf Coast, Lower

Field, County	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Agua Dulce, *Nueces-Jim Wells*	1930	98	109	7,742	1,834,264	4,102,760
Alamo, *Hidalgo*	1942					1,459
Alfred, *Jim Wells*	1938	17	22	480	167,072	631,942
Alice, *Jim Wells*	1938	31	50	1,326	385,321	3,173,041
Angelita, *San Patricio*	1934					29,214
Baffins Bay, *Kleberg*	1940					3,593
Baldwin (S. Saxet), *Nueces*	1935	4	12	313	76,419	951,274
Bandera, *Jim Wells*	1939					1,282
Beeville (Church), *Bee*	1935					1,000
Ben Bolt, *Jim Wells*	1939	46	66	2,350	669,771	2,699,870
Bentonville (Capt. Lucey), *Jim Wells*	1936	2	6	73	26,449	539,736
Bird Island, *Kleberg*	1939	1	1	6	4,010	39,148
Blanconia, *Bee*	1943	1	1	20	1,724	1,724
Blucher, *Jim Wells*	1939					3,021
Bonnieview, *Refugio*	1939					4,800
Burnell, *Karnes*	1938					1,328
Camada, *Jim Wells*	1939		1	1	269	4,687
Caesar (Ruhman), *Bee*	1934		16	45	20,128	1,054,298
Caesar (S.), *Bee*	1942	18	20	1,577	360,991	449,173
Chapman Ranch, *Nueces*	1937		2	35	12,401	81,950
Clara Driscoll, *Nueces*	1935	8	20	444	162,570	1,443,020
Clark-Muile, *Jim Wells*	1939					45,700
Coletto Creek, *Victoria*	1934	26	33	431	147,104	1,656,871
Cologne, *Victoria*	1939	7	7	260	86,452	198,514
Coloma Creek, *Calhoun*	1941	1	1	30	12,018	51,959
Coquat, *Live Oak*	1943					
Diamond Half, *Goliad*	1936		8	50	20,012	639,602
Dinero (Lucas-North), *Live Oak*	1935					83,913
Dirks, *Bee*	1934	1	85	1,082	200,739	6,287,321
Driscoll Ranch (Gandy), *Nueces*	1939	5	9	367	131,132	346,428
East Flour Bluff, *Nueces*	1940	20	20	1,156	271,612	622,494
East Plymouth (Gas), *San Patricio*	1941					262
E. White Pt., *San Patricio*	1938	228	233	11,115	3,851,559	15,076,018
Fagan, *Refugio*	1940	4	4	75	23,550	75,078
Flour Bluff, *Nueces*	1936	39	84	2,666	697,956	8,046,960
Fort Merrill, *Live Oak*	1935					32,000
Gallagher, *Jim Wells*	1940	5	5	159	48,264	124,230
Genevieve, *Bee*	1941					1,206
Gobel, *Live Oak*	1943	1	1	50	10,177	10,177
Grayburg (Kimble), *Bee*	1934					5,000
Greta, *Refugio*	1935	148	191	7,584	1,303,882	28,982,259
Greta, (Deep), *Refugio*	1933	9	9	595	99,551	1,471,412
Haldman (Seelig), *Jim Wells*	1941	1	2	35	12,312	31,356
Henshaw, *Jim Wells*	1940	1	2	45	17,090	57,516
Heyser, *Calhoun*	1936	169	201	9,621	3,334,434	20,496,231
Hobson, *Karnes*	1943	10	10	640	129,350	129,350
Holzmark, *Bee*	1930	5	5	75	14,497	99,940
	(1939)					
Hondo Creek, *Karnes*	1943	1	1	100	31,642	31,642
Hoards Creek, *Goliad*	1940	1	1	19	7,314	76,809
Jay Welder, *Calhoun*	1940	5	5	245	67,722	155,047
Keeran, *Victoria*	1932	15	21	740	198,946	1,838,690
Kingsville, *Kleberg*	1926	1	2	28	10,017	765,263
Kittie	1943				297	297
Koopman, *Jim Wells*	1942	1	1	42	14,784	25,166
La Blanca, *Hidalgo*	1937					617,742
La Gloria, *Jim Wells*	1939	2	2	41	14,406	76,021
La Mar, *Aransas*	1937					1,092
La Rosa, *Refugio*	1938	79	83	4,253	637,836	4,353,244
La Sal Vieja, *Willacy*	1936					15,000
London, *Neuces*	1937		3	45	15,013	112,157
Luby, *Nueces*	1937	135	144	3,970	1,221,202	8,852,886
Luby, (Deep), *Nueces*	1941	1	1	4	1,517	22,113
Luby, N., *Nueces*	1939	1	3	75	26,711	124,219
Lucas (Mt. Lucas), *Live Oak*	1923		3	36	13,790	346,739
McAllen (Pharr), *Hidalgo*	1938					16,596
McCampbell (Aransas), *Aransas-Patricio*	1936	73	185	3,520	660,076	12,210,430
McFaddin, *Victoria*	1930	63	87	5,497	1,747,812	5,437,811
McFaddin, N., *Victoria*	1937	4	5	250	47,927	116,918
McMurray, *Bee*			2			
McNeil, *Live Oak*	1934	2	2	28	9,791	287,752
Magnolia City, *Jim Wells*	1939	2	3	65	22,402	202,493
Magnolia City, N., *Jim Wells*	1943	4	4	150	17,591	17,591
Mathis, E., *San Patricio-Live Oak*	1940				232	14,108
Mellon Creek, *Refugio*	1939	10	10	524	191,293	751,782
Mercedes (Capsillo), *Hidalgo*	1935					191,431
Midway, *San Patricio*	1937	48	68	3,252	1,086,254	3,515,811
Minnie Rock, *Nueces*	1939	17	64	1,998	745,357	2,568,246
Mission River, *Refugio*	1938	14	19	625	247,465	1,872,641
Nordheim, *DeWitt*	1942					2,504
Normanna, *Bee*	1929	1	3	10	3,982	101,816
Normanna, N., *Bee*	1938					776
Oakville, *Live Oak*	1937	20	30	450	179,740	1,029,206
O'Connor, *Victoria*	1931		4	34	12,287	606,926
Odem, *Jim Wells*	1940	55	56	2,364	649,193	1,058,307
Orange Grove, *Jim Wells*	1940	24	32	1,257	514,100	1,630,113
Petronilla, *Nueces*	1942	6	6	200	62,577	100,272
Pettus, *Bee*	1928		28	355	66,202	9,086,717
Pettus, N., *Bee*	1934	1	50	500	143,679	3,548,692
Placedo, *Victoria*	1935	50	154	4,829	1,459,436	15,109,832
Placedo, E., *Victoria*	1938	26	27	982	252,371	833,707
Plummer, *Bee*	1937		1	7	3,198	275,902
Plymouth, *San Patricio*	1935	168	185	9,474	3,426,633	29,170,754
Porter, *Karnes*	1943	10	11	500	78,243	78,243
Port Lavaca, *Calhoun*	1934					420,941
Poth, *Wilson*	1943				257	257

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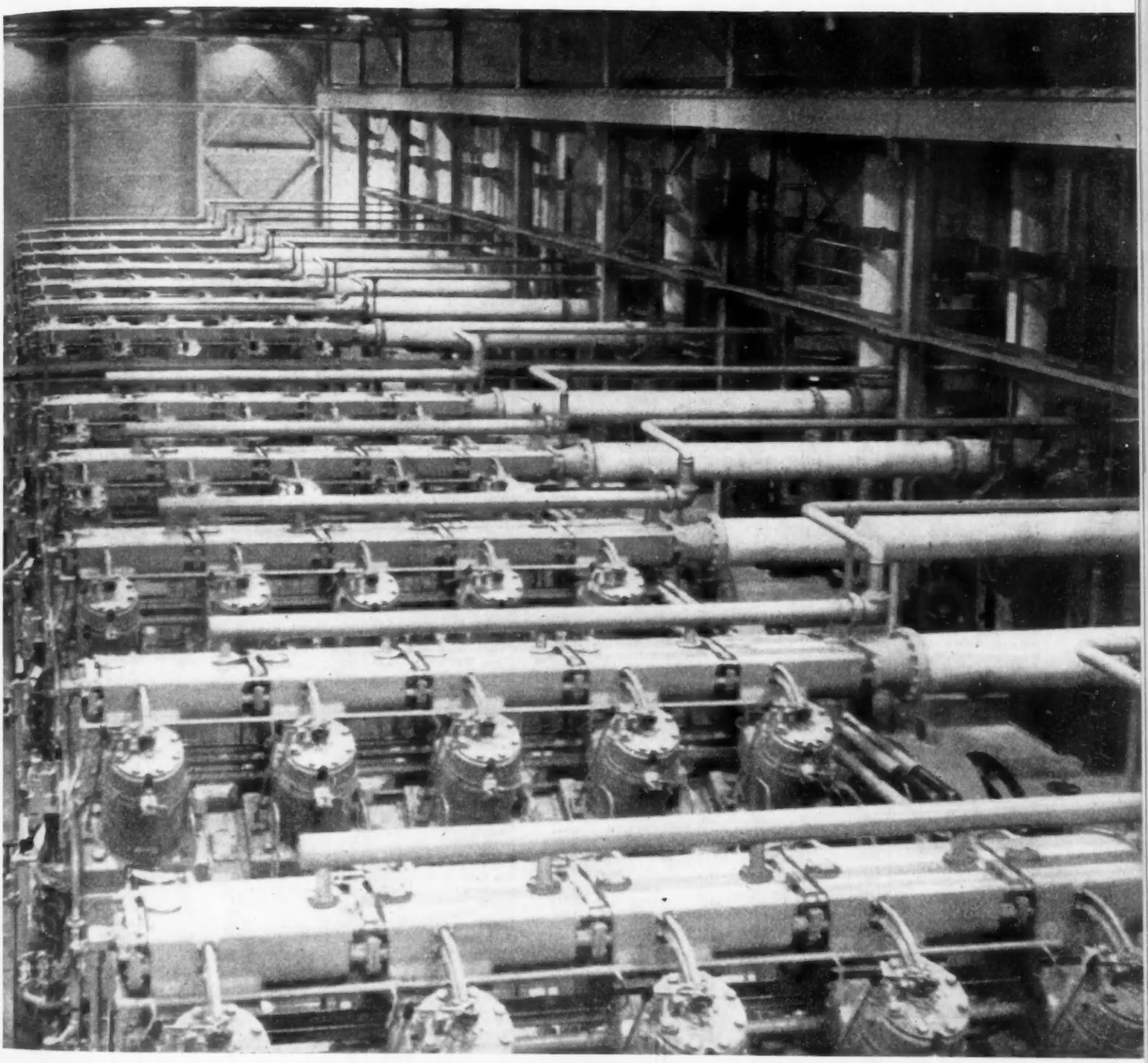
Simple Changes



by **Cooper-Bessemer**

MOUNT VERNON, OHIO AND GROVE CITY, PENNA.

BUILDERS OF DEPENDABLE ENGINES FOR 110 YEARS

Texas Gulf Coast, Lower—Continued

Field, County	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Premont (Seeligson), *Jim Wells*	1933	1	14	70	29,506	818,621
Premont Prospect, *Jim Wells*	1941		2	25	8,591	27,132
Quinto Creek, *Jim Wells*	1942	2	2	100	35,030	48,362
Ray, *Bee*	1935		10	150	26,562	1,615,265
Refugio, *Refugio*	1929	101	153	5,251	1,516,823	45,785,811
Refugio (Deep)	1920	77	100	3,961	1,207,939	10,422,419
Refugio, Fox	1931	12	16	493	88,396	4,315,243
Refugio, (Shallow)	1929	6	30	690	192,207	30,971,916
Refugio, N	1941	6	7	107	28,281	76,233
Reynolds, *Jim Wells*	1939	15	23	450	181,744	1,375,923
Richard King, *Nueces*	1937	75	80	3,167	959,981	2,897,251
Riverside, *Nueces*	1939	2	2	71	24,804	137,056
Robstown, *Nueces*	1939	5	5	130	31,838	110,419
Rooke, *Refugio*	1942	5	5	232	63,238	65,947
Rutledge, *Bee*	1935					21,000
St. Charles, *Aransas*	1940	1	1	6	2,001	43,786
Salvador (Las Mestenas), *Hidalgo*	1937					159,800
Sandia, *Jim Wells*	1937		2			29,242
Sarco, *Goliad*	1938					2,401
Saxet, *Nueces*	1930	43	300	7,264	2,495,771	56,238,398
Saxet, (Shallow)	1930	22	216	3,872	1,309,321	30,729,855
Saxet, (Deep), (Frio)	1936	21	84	3,392	1,186,450	25,508,543
Saxet Heights (Corpus Christi), *Nueces*	1935	1	3	50	30,797	6,759,232
Seeligson (E. Premont), *Jim Wells*	1938	162	163	10,580	1,529,659	2,249,297
Shield, *Nueces*	1940	7	10	396	133,004	387,152
Sinton, *San Patricio*	1934					71,240
Slick, *Goliad*	1930					75,537
Slick, Wilcox, *Goliad*	1943	6	6	500	62,149	62,149
South Burnell, *Karnes*	1937	1	25	264	60,540	1,063,692
South Clara Driscoll, *Nueces*	1937	42	98	2,167	834,210	4,221,304
Stratton, *Nueces*	1938	150	150	9,523	1,715,236	3,175,853
Strauch (McMurry), *Bee*	1937					6,934
Taft, *San Patricio*	1936	43	69	2,657	462,509	5,817,154
Telferner, *Victoria*	1938		2	12	4,480	67,046
Terrell, *Victoria*	1940					13,663
Thomaston, *DeWitt*	1940				3	9,847
Tom Graham (E. Alice), *Jim Wells*	1938	33	33	1,301	373,782	1,785,211
Tomoconnor, *Refugio*	1934	447	448	43,647	12,690,095	46,683,560
Tuleta, *Bee*	1934	3	17	70	20,017	1,961,622
Tulsita, *Bee*	1939		1	5	1,401	11,616
Tynan, *Bee*	1943	1	1	14	5,035	5,035
Victoria, *Victoria*	1940	2	15	150	58,145	367,178
Voss, *Bee*	1936					78,446
Wade City, *Jim Wells*	1939	71	93	2,525	945,954	3,866,097
Weser, *Goliad*	1937		1	13	4,201	32,262
Weslaco, *Hidalgo*	1938					1,995
West Saxet (Turkey Creek), *Nueces*	1938	37	49	1,317	468,620	4,766,501
White Creek, *Live Oak*	1939	3	30	175	70,559	403,793
White Creek, S., *Live Oak*	1941	5	7	215	83,511	148,518
White Point, *San Patricio*	1919		1	70	24,680	202,833
Whittington, *Live Oak*	1935					3,000
Willamar, *Willacy*	1940	8	8	697	122,562	186,867
Woodsboro, *Refugio*	1941	7	7	375	78,768	137,042
Yorktown, *DeWitt*	1942					1,525
Total Texas Gulf Coast, Lower	....	3,025	4,378	190,556	53,178,181	401,432,434

Southwest Texas

Adami, *Webb*	1939		59	210	82,228	561,671
Agua, Prieta, *Duval*	1941	1	1	4	1,780	9,812
Albercas, *Webb*	1928				2,530	2,547,008
Alta Mesa, *Brooks*	1936	2	33	1,000	154,129	1,345,192
Alta Verde, *Brooks*	1938					6,667
Alworth, *Zapata-Jim Hogg*	1927					27,000
Armstrong	1943	1	1	50	5,964	5,964
Aviator, *Webb*	1922		74	233	84,841	6,276,142
Barbacoas, *Starr*	1934	1	1	1	329	35,504
Benavides, E., *Duval*	1941	1	1	25	7,422	20,521
Blanchard, *Duval*	1939	2	2	10	5,770	51,167
Boyle, *Starr*	1940	14	15	400	124,623	292,313
Bridwell, *Duval*	1940	11	11	225	47,230	149,181
Bruni, *Webb*	1934	1	15	40	15,970	2,450,230
Bruni, E., *Webb*	1937	1	12	40	15,228	359,468
Cadena, *Duval*	1942	7	7	190	64,513	69,157
Calliham, *McMullen*	1919		46	110	41,111	980,119
Cameron, *Starr*	1943	2	2	150	18,886	18,886
Campana, S., *McMullen*	1941	15	16	180	64,220	124,285
Carolina-Texas, *Webb*	1921					262,402
Casa Blanca, *Duval*	1938		49	656	219,089	798,636
Casa Blanca, W., *Duval*	1940		16	200	50,773	135,370
Casa Blanca, N., *Duval*	1939		9	90	32,205	146,678
Cedro Hill, *Duval*	1939	12	7	1,000	227,434	941,531
Charamousca, *Duval*	1937		18	173	62,481	714,942
Charamousca, S., *Duval*	1941	1	16	108	38,614	157,334
Charco Redondo, *Zapata*	1919		28			162,166
Chiltipin, *Duval*	1939	5	5	15	6,254	52,541
Cole, E. and W., *Webb-Duval*	1924		68	370	144,082	4,950,972
Colmena, *Duval*	1936	1	20	134	48,221	572,123

Southwest Texas—Continued

Field, County	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Colorado, *Jim Hogg*	1936	195	235	2,483	557,464	2,872,369
Comitas, *Zapata*	1934		142	256	106,417	1,768,910
Conoco-Driscoll, *Duval*	1927	75	79	3,864	1,046,077	5,808,566
Cuellar, *Zapata*	1928		16	35	13,539	2,647,783
Dulup	1943	2	6	125	36,627	36,627
Eagle Hill, *Duval*	1933		50	713	193,037	1,885,560
East, *Jim Hogg*	1942	7	7	225	36,906	37,083
Escobas, *Zapata*	1929		245	746	261,105	8,038,830
Ezzell, *McMullen* and *Live Oak*	1937		125	644	243,153	2,973,359
Fitzsimmons, *Duval*	1938	55	76	1,247	302,776	2,860,017
Fitzsimmons, E., *Duval*	1940					485
Frost, *Starr*	1942	2	2	10	3,166	5,271
Garcia, *Starr*	1942	4	4	274	58,913	77,067
Glenn, *Webb*	1940	4	68	1,525	358,335	1,181,398
Government Wells, *Duval*	1928	1	629	6,870	2,345,296	52,064,218
Govt. Wells, North	1928		394	4,595	1,518,236	32,750,467
Govt. Wells, N., Yegua	1941	1	2	35	12,353	27,676
Govt. Wells, N., 1800′ sd.	1942		3	51	17,350	38,194
Govt. Wells, S.	1928		230	2,189	797,357	19,247,881
Guerra (Cuevitas), *Starr*	1933	8	10	552	139,173	1,424,073
Henne-Winch-Farris, *Jim Hogg*	1924				295	3,215,499
Hoffman, *Duval*	1935	5	333	4,402	1,501,885	10,409,084
Holland-Hebbronville, *Jim Hogg*	1940					1,348
Holbein, *Jim Hogg*	1940		10	105	32,240	106,683
Jacobs, *McMullen*	1932		71	235	84,885	1,736,045
Jennings, *Zapata*	1932		71	741	233,694	2,776,505
Kelsey, *Jim Hogg*	1938	86	90	3,764	543,214	2,546,042
Killam, *Webb*	1937		82	400	155,847	1,248,767
Killam, N., *Webb*	1938		4	20	7,132	76,116
Kohler, S., *Duval*	1926		7	23	9,301	628,827
Kohler, (Deep), N., *Duval*	1936	1	1	1	1,425	63,223
Kreis, *Duval*	1941		10	175	60,845	128,996
Labbe, *Duval*	1937		12	149	48,815	475,203
La Reforma, *Starr*	1938	1	1	10	4,493	30,058
Las Animas, *Jim Hogg*	1938		7	35	16,780	71,803
Laurel, *Webb*	1932		3	7	2,656	628,546
Lockhart, *Starr*	1943	9	10	425	72,617	72,617
Loma Alta, *McMullen*	1935		3	1,333	15,825	178,267
Loma Novia, *Duval*	1934		528	4,222	1,609,837	28,369,220
Loma Vista, *Duval*	1936	1	1	4	1,978	18,586
Longhorn, *Duval*	1938	28	42	1,067	365,587	2,222,143
Lopez, *Duval*	1935		308	2,468	945,554	13,405,285
Los Olmos, *Starr*	1925		75	30	10,605	656,901
Lundell, *Duval*	1937	26	93	980	338,116	1,772,434
Lykes, *Webb*	1942		1	2	720	1,629
McLean, *Webb*	1942		5	191	66,902	129,182
Manila, *Jim Hogg*	1940	2	19	125	46,387	270,978
Mirando City, *Webb*	1922		62	250	93,188	9,393,099
Mirando Valley, *Zapata*	1921		66	200	75,213	1,561,558
Moca, *Webb*	1932		11	150	55,296	1,243,290
Munson, *McMullen*	1938		10	40	15,966	197,410
Neuhaus, *Jim Hogg*	1942	1	2	30	12,405	22,196
Nichols, *Hidalgo*	1941	5	13	296	116,280	296,838
North Rincon, *Starr*	1939	6	10	300	77,971	209,023
North Sweden (Benavides), *Duval*	1937	88	208	3,548	1,166,528	12,665,310
O'Hern, *Duval and Webb*	1936		183	1,772	662,285	11,335,373
Oilton, *Webb*	1937		59	175	68,306	1,724,038
Palangana, *Duval*	1928					4,000
Peters, *Duval*	1933	1	4	60	23,061	259,935
Peters, E., *Duval*	1940	1	4	25	8,197	33,884
Piedra de Lumbre, *Duval*	1935	2	130	2,855	791,409	4,027,002
Piedras Pintas, *Duval*	1925					147,215
Rancho Solo, *Duval*	1937		22	75	28,847	303,837
Rancho Solo Extension, *Duval*	1940	1	15	40	17,915	195,980
Randado, *Jim Hogg*	1925		82	160	58,677	4,945,891
Ricaby, *Starr*	1937		9	80	22,805	151,072
Rincon, *Starr*	1938	141	146	7,037	2,327,114	5,940,017
Rio Grande City, *Starr*	1932		19	25	13,545	447,539
Robinson	1943	1	1		172	172
Rodriguez, *Starr*	1941					40
Roma, *Starr*	1928					17,308
Ross	1943	2	3	50	4,878	4,878
S. R. C., *Duval*	1930					203,000
Sam Fordyce, *Starr-Hidalgo*	1934	2	45	300	96,624	7,366,958
Sam Fordyce, N., *Hidalgo*	1937		1	12	3,788	221,814
Sarnosa, *Duval*	1932		34	325	116,154	2,782,208
Sejita, *Duval*	1940	12	12	1,100	127,510	140,577
Seven Sisters, *Duval*	1935	2	388	6,722	1,844,588	19,548,052
Seven Sisters, S., *Duval*	1937		24	105	40,887	732,645
Southland, *Duval*	1939	3	3	142	49,224	181,091
South Ricaby (El Tanque), *Starr*	1937	1	8	5	2,872	435,115
Strake, *Duval*	1943	3	3	235	54,877	54,877
Sullivan City, *Hidalgo*	1940	21	24	550	113,336	604,808
Sun, *Starr*	1938	75	81	3,182	804,225	1,964,097
Sun, N., *Starr*	1942	26	26	1,288	236,956	262,074
Sweden, *Duval*	1937	2	4	50	15,719	267,996
Tarancuas, *Duval*	1940		27	783	201,895	610,964
Tesoro (De Soto), *Duval*	1938	2	2	50	11,000	220,576
Thomas Lockhart, *Duval*	1937					12,083
Volpe, *Webb*	1939		28	395	126,137	599,634
Washburn Ranch, *LaSalle*	1940	18	20	1,240	165,125	255,782
Weil	1943	1	1	100	10,822	10,822
Yeager, *Jim Hogg*	1943	3	4	175	27,293	27,293
Yturria, *Starr*	1941	11	11	575	134,922	201,888
Yzaguirre, *Starr*	1940		1	1	668	5,243
Zim, *Starr*	1939	1	1		517	517
Total Southwest Texas	....	1,022	5,890	80,600	23,270,743	270,983,887

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WAUKESHA SALES & SERVICE, INC.

1422 Maury Street

HOUSTON, TEXAS

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Distributors for

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AS OF JANUARY 1, 1944, the sale of Waukesha Motor Company internal combustion engines and parts to the oil industry, formerly handled by the Portable Rig Company, has been taken over by WAUKESHA SALES & SERVICE, Inc., Houston, Texas, a newly formed corporation.

Main offices, central warehouse, repair department, shop and equipment will be maintained at 1422 Maury St., Houston.

All field branches formerly operated by the Portable Rig Company will now be operated by WAUKESHA SALES & SERVICE, Inc., to insure uninterrupted service.

The trained personnel of the engine division of the Portable Rig Company will be retained by WAUKESHA SALES & SERVICE, Inc.

Subject to the restrictions necessarily imposed on us by existing war contracts, we shall make every effort to provide prompt and efficient service to the industry.

BRANCH STORES: Corpus Christi • Odessa • Dallas • Kilgore • New Iberia

South Central Texas

Field, *County*	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Alta Vista, *Bexar*	1915	.....	.....	.....	51	59,503
Bateman, *Bastrop*	1932	.....	1	6	2,028	623,582
Batesville, *Zavalla*	1937	.....	.....	.....	.....	12,000
Bee Creek, *Caldwell*	1940	.....	25	30	17,667	278,847
Bob Rose, *Caldwell*	1932	.....	2	8	3,350	238,564
Branyon, *Caldwell*	1928	.....	*	*	*	*2,759,913
Buchanan, *Caldwell*	1929	.....	22	55	21,545	472,603
Burdette Wells, *Caldwell*	1938	.....	2	5	1,177	41,291
Carrizo, *Dimmitt*	1941	1	1	.....	142	4,878
Carroll Estate, *Bastrop*	1933	.....	.....	.....	.....	100,487
Carver-Kallison, *Guadalupe*	1937	.....	.....	.....	.....	46,012
Cedar Creek, *Bastrop*	1913	.....	7	25	10,309	233,958
Cedar Creek, North, *Bastrop*	1934	.....	.....	.....	.....	70,018
Chapman-Abbot, *Williamson*	1930	.....	70	130	48,302	4,637,006
Chicon Lake, *Medina*	1923	.....	74	45	14,200	100,985
Clark, *Guadalupe*	1935	.....	2	28	6,065	397,970
Cooksey, *Bexar*	1930	.....	.....	.....	.....	61,000
Dale, *Caldwell*	1927	.....	37	97	36,203	1,483,246
Dale, West, *Caldwell*	1932	.....	8	28	10,528	123,046
Darst Creek, *Guadalupe*	1929	6	342	9,637	2,746,716	56,532,078
Day, *Guadalupe*	1940	.....	.....	.....	.....	575
Deupree, *Bexar*	1936	.....	3	3	897	897
Dulnig Ranch, *Bexar*	1889	.....	.....	.....	.....	361
Dunlap, *Caldwell*	1931	.....	7	38	11,655	149,375
Dunlay, *Medina*	1938	.....	.....	.....	.....	985
Eckert, *Bexar*	1928	.....	101	60	21,845	996,864
Elgin, *Bastrop*	1941	.....	.....	.....	.....	1,648
Ellison-Young, *Caldwell*	1937	.....	11	18	6,081	150,697
Espanda Mission, *Bexar*	1926	.....	.....	.....	.....	77
Fairfield, (LaCoste), *Bexar*	1938	.....	1	2	434	4,633
Gas Ridge, *Bexar*	1937	.....	64	30	12,457	52,230
Green Branch, *McMullen*	1943	1	1	25	2,380	2,380
Hilbig, *Bastrop*	1933	12	12	700	123,071	1,801,544
Imogene, *Atascosa*	1942	3	4	150	26,288	28,052
Jones, *Bexar*	1916	.....	.....	.....	122	698
Kimbro (Manda), *Travis*	1934	.....	4	5	1,348	18,346
LaVernia (Elm Creek) *Guadalupe*	1939	.....	29	25	8,686	41,162
Lentz, *Bastrop*	1941	.....	3	20	8,544	24,897
Larremore, (Lockhart) *Caldwell*	1900	.....	.....	.....	5,575	343,744
Lone Oak, *Bexar*	1935	.....	.....	.....	.....	2,000
Luling, *Guadalupe-Caldwell*	1923	.....	*733	*4,840	*1,780,840	*80,579,265
Lytton Springs, *Caldwell*	1925	.....	130	230	84,594	8,134,820
Manford, *Guadalupe*	1929	.....	1	20	6,539	495,667
Matthews, *Williamson*	1933	.....	10	10	4,365	143,933
Minerva-Rockdale, *Milam*	1921	.....	401	180	64,399	3,784,523
Noack, *Williamson*	1934	.....	31	35	12,659	455,894
Ottine, *Gonzales*	1902	.....	.....	.....	.....	12,000
Pearsall, *Frio*	.....	11	37	878	257,878	1,921,853
Riddle, *Bastrop*	1938	.....	3	23	8,708	94,307
Salt Flat, *Caldwell*	1928	1	256	2,161	836,202	44,572,717
Schattel, *Frio*	1938	.....	.....	.....	.....	633
Schimmel-Batts, *Bastrop*	1935	.....	.....	.....	.....	7,000
Somerset, *Bexar-Atacosa*	1917	.....	461	235	89,258	11,732,784
Southton, (Yturri-Southton), *Bexar*	1922	.....	104	40	14,317	680,124
Spiller, *Guadalupe*	1938	.....	3	10	2,901	10,533
Staples, *Guadalupe*	1935	.....	.....	.....	.....	1,000
Tanglewood (Chriesman), *Burleson*	1938	.....	.....	.....	.....	14,753
Taylor-Ina, *Medina*	1901	.....	9	8	1,286	165,294
Tenney Creek, *Caldwell*	1940	14	23	400	94,497	301,498
Thrall, *Williamson*	1915	.....	21	41	15,961	2,507,176
Von Ormy, *Bexar*	1935	.....	102	45	17,263	292,117
Walnut Creek, *Caldwell*	1938	.....	1	2	973	4,187
Yoast, *Bastrop*	1928	.....	4	22	5,815	951,532
Zoboroski, *Guadalupe*	1931	.....	14	40	14,767	252,551
Total South Central Texas	....	49	3,177	20,390	6,460,888	229,014,313

* For 1943 only, data for Branyon included with Luling; Branyon production in 1943, here included with Luling, is estimated to have totalled less than 175,000 barrels, as Branyon produced 172,250 barrels in 1942.

Texas Panhandle

Carson County	1923	4	725	12,500	4,744,798	47,254,486
Gray County	1925	12	2,426	45,000	15,516,344	216,156,739
Hutchinson County	1922	13	2,107	32,500	11,665,504	179,630,805
Moore County	1927	3	14	400	155,713	5,476,548
Osborne Area	....	4	52	.....	205,262	205,262
Potter County	1918	.....	.....	.....	.....	44,000
Wheeler County	1925	.....	354	4,000	1,177,027	25,085,842
Total Texas Panhandle	....	36	5,678	94,400	33,464,648	473,853,682

West Texas

Abell, *Pecos*	1940	7	12	3,692	954,883	1,861,727
Abell Permian, *Pecos*	1941	16	22	420	95,029	183,627
Anthony (Toyah), *Reeves*	1939	.....	.....	.....	.....	2,201
Apco-Warner (Masterson Deep), *Pecos*	1939	32	33	1,381	314,574	570,948

West Texas—Continued

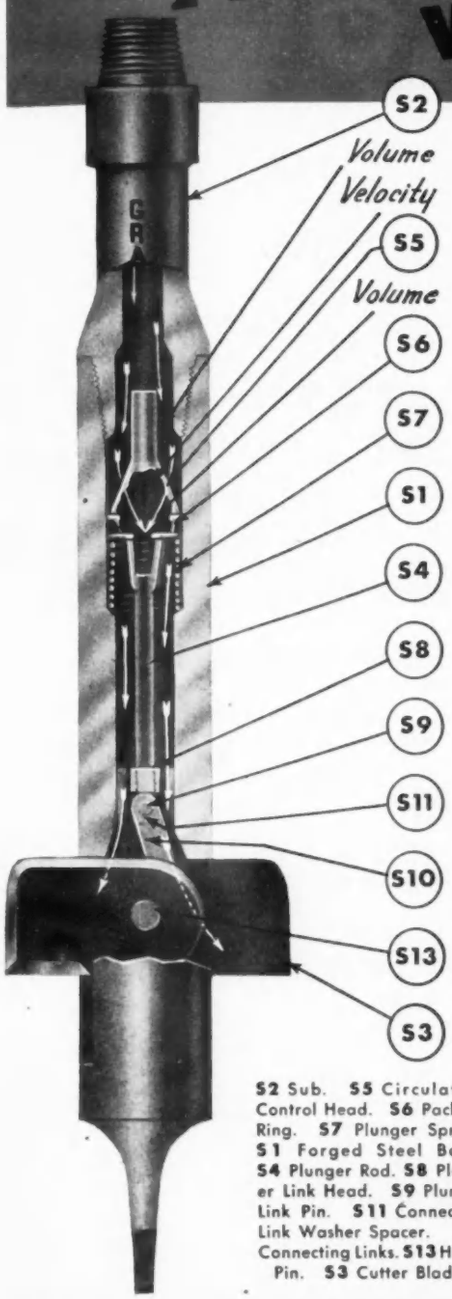
Field, *County*	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Barnhart, *Reagan*	1941	25	25	1,028	230,662	338,373
Bean, *Crockett*	1941	.....	.....	.....	.....	3,864
Beddo, *Runnels*	1938	.....	6	52	32,286	123,939
Big Lake, *Reagan*	1928	6	194	4,900	1,812,589	102,427,268
Blackwell, *Coke*	1942	.....	1	7	2,620	5,580
Bolt, *Kimble*	1940	1	2	2	505	505
Byrd, *Ward*	1942	6	6	170	46,750	53,694
Carter, *Glasscock*	1937	.....	.....	.....	.....	30,772
Cedar Lake, *Gaines*	1939	.....	52	2,286	466,088	1,020,577
Chancellor, *Pecos*	1942	.....	.....	74	21,696	37,965
Chalk, *Howard-Glasscock*	1926	9	824	13,303	4,831,224	109,023,329
Clabber Hill	1943	.....	1	50	6,132	6,132
Clara Couch, *Crockett*	1941	1	7	50	17,262	27,848
Crockett (McCamey S.), *Crockett*	1938	7	38	265	90,767	446,617
Crane-Cowden, *Crane-Upton*	1925	.....	99	375	145,569	5,578,098
Dean, *Cochran*	1938	6	8	170	47,587	123,635
Deep Rock, *Andrews*	1933	2	12	160	19,488	753,777
Dobbs, *Ward*	1936	.....	1	6	2,486	22,709
Dodson, *Concho*	1940	.....	.....	.....	633	2,574
Dune, *Crane*	1938	9	26	539	161,261	729,463
Duoro, *Ector*	1941	.....	.....	.....	.....	552
Eaves, *Winkler*	1936	5	10	807	200,202	915,521
Edwards, *Crane*	1935	.....	1	.....	1,186	21,340
Ella Waddell, *Crane*	1940	1	5	113	30,848	81,565
Embar, Deep (Ellenburger), *Andrews*	1942	17	17	1,700	355,981	450,593
Embar, Shallow, (Permian), *Andrews*	1942	12	12	920	278,025	289,574
Emma, *Ector*	1937	12	68	2,194	379,682	1,634,229
Emperor, *Winkler*	1935	74	83	1,103	421,344	2,884,166
Emperor, Deep, *Winkler*	1935	28	38	325	113,681	1,071,328
Estes, *Ward*	1934	198	336	4,687	1,460,229	15,648,668
Foster, *Ector*	1936	272	556	12,504	2,588,444	18,092,525
Fromme, *Pecos*	1939	5	7	45	17,170	109,362
Fuhrman, *Andrews*	1930	41	55	1,740	301,714	3,547,702
Fuhrman, West, *Andrews*	1941	.....	.....	.....	8,318	54,483
Fullerton, *Andrews*	1942	23	23	1,625	325,278	433,085
Funk, *Tom Green*	1940	.....	.....	1	1,120	1,788
Garza (Post City), *Garza*	1937	.....	4	20	6,326	39,526
Goldsmith, (Cummings), *Ector*	1935	900	956	22,600	7,361,461	46,744,705
Goldsmith, North, *Ector*	1940	7	10	75	27,380	128,279
Grassroots, *Pecos*	1940	.....	.....	.....	.....	442
Grayson (Skelly-Grayson), *Reagan*	1928	.....	5	90	31,505	694,789
Gulf-McElroy, *Crane-Upton*	1926	89	590	21,000	6,114,587	133,165,683
Halley (Skelly-Halley), *Winkler*	1934	7	29	348	86,051	1,098,861
Harper, *Ector*	1933	16	184	1,980	522,555	8,496,223
Heiner, *Pecos*	1941	2	2	50	11,728	17,372
Henderson, *Winkler*	1936	112	139	5,260	1,620,751	8,054,423
Hendricks, *Winkler*	1926	40	279	5,350	2,079,141	206,320,348
Herrington, *Upton-Crane*	1938	.....	1	.....	4,818	91,671
Hoover, *Crockett*	1941	.....	2	1	1,211	10,574
Huddleston, *Runnels*	1940	1	1	10	4,083	18,712
Hurdle, *Upton-Crane*	1936	.....	12	40	15,446	251,840
Iatan East Howard, *Howard-Mitchell*	1921	26	316	3,707	1,334,539	17,685,778
Iatan, North	1943	.....	1	25	4,677	4,677
Irion (Mertzon), *Irion*	1929	.....	1	5	812	140,483
Jamison & Pollard, *Pecos*	1941	1	1	55	22,054	68,924
Johnson, *Ector*	1935	77	126	4,280	831,659	2,684,216
Jordan, *Crane*	1937	175	225	6,289	1,576,849	7,379,653
Justiceburg, *Garza*	1937	.....	.....	.....	.....	16,416
Kermit, *Winkler*	1926	148	812	3,282	1,285,288	30,796,511
Kermit, (Ellenberger), *Winkler*	1943	1	1	220	55,228	55,228
Keystone, *Winkler*	1930	272	372	4,886	1,751,615	11,413,770
Keystone, Colby Sand	1930	197	268	3,330	1,229,288	.....
Keystone, Ellenburger	1943	1	1	195	40,737	.....
Keystone, Lime	1935	74	103	1,361	481,590	.....
Leck, *Winkler*	1928	1	9	452	142,442	4,041,294
Lehn, *Pecos*	1939	19	52	175	72,242	450,786
Live Oak, *Crockett*	1941	.....	1	4	606	3,638
Lubbock, *Lubbock*	1942	.....	1	.....	523	1,891
McCamey (McCamey-Webb-Ray), *Upton-Crane*	1925	9	835	9,001	3,205,465	57,617,235
McKee, *Crane*	1942	.....	2	150	36,433	44,819
McMillan, *Runnels*	1927	1	3	4	2,167	987,492
Melvin, *McCullough*	1938	.....	1	.....	.....	65
Magnolia Sealey, *Ward*	1939	1	53	600	211,352	1,224,058
Magnolia-Sealey, South, *Ward*	1940	18	18	750	250,641	505,001
Mascho, *Andrews*	1942	30	56	1,900	183,180	188,238
Mason, *Loving*	1937	6	9	155	55,652	554,634
Masterson, Shallow, *Pecos*	1929	.....	24	126	46,726	1,041,776
Masterson, 3500' Sand, *Pecos*	.....	1	1	80	14,892	14,892
Means, *Andrews*	1934	41	110	4,035	798,541	6,860,210
Monahans, *Ward*	1942	1	1	200	73,003	124,024
Monahans, Permian, *Ward*	.....	1	1	33	10,972	13,581
Monroe, *Ward*	1931	1	1	15	5,567	69,196
Moore, *Howard*	1937	.....	7	45	16,308	110,254
Moss, *Ector*	1938	.....	.....	.....	.....	1,861
Netterville, *Pecos*	1936	11	15	50	20,667	400,380
Nichols, *Ward*	1942	.....	.....	.....	.....	1,464
Noelke, *Crockett*	1940	34	36	820	178,347	358,145
North Cowden, *Ector*	1930	443	557	24,500	4,058,538	27,880,919
North Cowden, Deep, *Ector*	1939	3	5	85	25,787	142,167
Olson, *Crockett*	1941	.....	4	65	15,244	25,281
Opp (El Dorado), *Schleicher*	1939	.....	.....	.....	.....	3,142
Ownby, *Yoakum*	1941	8	8	167	49,760	119,156
Page, *Schleicher*	1937	1	1	25	8,580	101,460
Parker, *Andrews*	1935	.....	2	28	9,635	99,870

CONTINUED ON PAGE 176

GRANT

2-BLADE HYDRAULIC EXPANSION WALL SCRAPER

INCREASES PRODUCTION
SAVES CASING • ASSURES
BETTER CEMENT JOBS



S2 Sub. **S5** Circulation Control Head. **S6** Packing Ring. **S7** Plunger Spring. **S1** Forged Steel Body. **S4** Plunger Rod. **S8** Plunger Link Head. **S9** Plunger Link Pin. **S11** Connecting Link Washer Spacer. **S10** Connecting Links. **S13** Hinge Pin. **S3** Cutter Blades.

Here's a GRANT tool which is vitally important for every drilling program. Use it to enlarge the area of the exposed producing sand to increase production, and to enlarge the hole in SOFT formations to permit running larger casing and thus save a string. The GRANT Wall Scraper is also the ideal tool to secure better cement jobs. It will enlarge the hole above the point where the casing shoe is to be set, thus assuring a thick body of cement around the casing which will not be disturbed in following drilling operations. When placing a cement plug, the GRANT Wall Scraper will enlarge the hole where the plug is to be set. This exposes the formation to create a better bond for the cement. Gravel Packing, Water Shut-Off Tests and the Cutting Out of Drillable Pipe are performed more effectively when the GRANT Wall Scraper is used.

Savings effected by using the GRANT Wall Scraper are especially large in foreign fields. Few parts mean stronger parts, freedom from breakage, and smaller warehouse stocks.

For hard formation, use the GRANT Roller Cutter Hole Enlarger. See Composite Catalog or write for further details.

CIRCULATION CONTROL HEAD ASSURES BIG SAVINGS

Destructive action of sand and other abrasive materials on vital parts is practically eliminated in the GRANT Wall Scraper by the CIRCULATION CONTROL HEAD. As seen in the illustration at left, the circulation flow is streamlined and the only point of high velocity is where it passes through the upper slots of the CIRCULATION CONTROL HEAD. Here the streams are directed AGAINST EACH OTHER within the HEAD, thus destroying the destructive action of the sand in the mud which otherwise would be exerted against expensive steel parts.

The CIRCULATION CONTROL HEAD can quickly be changed to suit any condition—large slots for big pumps—small slots for small pumps. Simply reduce the size of slots. The GRANT Flow Bean will last for years.

GRANT OIL TOOL CO.

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West Texas—Continued

Field, County	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
Payton, *Pecos*	1938	15	128	800	305,951	3,142,625
Pecos Valley, High Gravity, *Pecos*	1928	39	98	361	150,311	1,824,326
Pecos Valley, Low Gravity, *Pecos*	1928	25	67	248	95,940	1,115,963
Penwell, *Ector*	1926	75	170	3,318	922,993	24,243,587
Pruitt, *Ward*	1942	.....	1	.....	1,299	2,824
Pyote, *Ward*	1942	2	2	85	26,247	48,235
Rhodes, *Cochran*	1941	.....	1	10	2,746	7,917
Richards (Pryor), *Pecos*	1929	.....	3	.....	505	17,340
Robertson, *Gaines*	1942	1	1	36	13,709	16,962
Russell, *Gaines*	1943	1	2	200	35,799	35,799
Rowan Tong, *Pecos*	1929	.....	.....	.....	.....	2,000
Sand Hills, Deep, (Ordovician), *Crane*	1936	30	32	1,650	529,713	1,352,020
Sand Hills, Shallow (Permian), *Crane*	1934	117	138	5,029	1,357,299	5,074,698
Sand Hills, South, *Crane*	1941	.....	.....	.....	.....	210,958
Sand Hills, West, *Crane*	1943	.....	1	10	1,787	1,787
Scanlan, *Dawson*	1938	.....	.....	.....	.....	310
Scarborough, *Winkler*	1927	59	127	1,000	437,553	7,287,053
Seminole, *Gaines*	1937	287	298	14,300	2,828,538	8,118,862
Shannon, *Crockett*	1943	.....	.....	39	9,460	9,460
Sharon Ridge (Ira), *Scurry*	1924	15	182	1,023	371,810	1,701,815
Shearer, *Pecos*	1938	5	43	366	160,382	1,346,415
Simpson, *Crockett*	1938	.....	1	.....	428	4,350
Shipley, *Ward*	1928	11	130	1,456	483,444	6,134,751
Shipley, Silurian, *Ward*	1940	2	2	22	6,822	45,120
Slaughter, *Hockley*	1937	1,342	1,446	40,823	11,179,800	25,235,785
Snyder, *Howard*	1936	.....	101	583	230,640	2,562,545
South Cowden, (Addis-Odessa), *Ector*	1933	83	123	4,704	862,299	3,641,280
Spencer, *Ward*	1941	5	11	269	75,829	126,096
Stinnett, *Lubbock*	1942	.....	1	.....	.....	.....
Swenson, *Garza*	1939	.....	.....	.....	.....	1,515
Taylor-Link, *Pecos*	1929	25	132	1,340	585,443	8,277,032
Toborg, *Pecos*	1930	.....	257	1,438	476,388	7,917,612
Todd, Deep, *Crockett*	1940	14	14	247	80,826	278,382
Union	1943	1	1	25	5,865	5,865
Vincent, *Howard*	1943	.....	1	25	5,933	5,933
Waddell (Gulf-Waddell), *Crane*	1927	73	85	2,384	721,004	4,918,075
Walker, *Pecos*	1940	60	71	1,389	358,029	759,566
Waples-Platter, *Yoakum*	1939	3	7	100	32,303	94,879
Ward, North, *Ward*	1940	248	422	7,450	2,249,113	27,240,090
Ward, South, *Ward*	1928	95	563	2,270	880,269	28,079,914
Wasson, *Gaines-Yoakum*	1936	1,335	1,437	44,325	12,559,770	55,184,879
Wasson	1936	1,333	1,435	44,222	12,525,841	55,082,057
Wasson, Deep	1941	1	1	60	19,106	55,055
Wasson "72"	1942	1	1	43	14,823	47,767
Webb-Ray, *Upton-Crane*	1935	.....	2	10	3,291	58,887
Weiner, *Winkler*	1941	29	33	1,000	266,712	349,394
Welch, *Dawson*	1941	.....	1	25	9,118	19,176
Wentz, *Pecos*	1941	.....	2	65	22,485	44,234
West, *Yoakum*	1938	.....	1	23	7,634	51,815
West Andrews, *Andrews*	1940	5	19	105	44,744	102,597
Westbrook, *Mitchell-Scurry*	1921	.....	93	714	219,207	10,621,587
Wheat, *Loving*	1926	35	87	850	299,332	9,243,166
Wheeler, Ellenburger, *Winkler*	1943	1	1	220	40,011	40,011
White-Baker, *Pecos*	1935	28	28	367	119,279	375,133
White-Baker, Lime, *Pecos*	.....	1	1	35	1,581	1,581
Winters, *Runnels*	.....	.....	2	15	6,621	6,621
World, *Crockett*	1925	.....	88	2,024	702,190	8,457,964
Wyatt (Todd), *Crockett*	1932	1	1	18	5,924	38,830
Yates, *Pecos and Crockett*	1926	511	556	31,992	8,671,035	275,052,170
Yates, Smith Sand, *Pecos*	1939	.....	10	108	37,837	549,538
Total West Texas	.....	7,898	15,486	354,628	98,529,695	1,378,065,365

West Central Texas

Brown County Total	.....	3	815	1,135	425,619	31,732,155
Callahan County Total	1916	9	1,131	650	245,374	15,498,862
Prichard, *Callahan*	.....	1	1	5	5,570	6,790
Unclassified, *Callahan*	.....	8	1,130	645	223,647	15,492,072
Coleman County Total	1902	97	395	2,079	716,403	12,912,649
Coker, *Coleman*	1942	12	12	370	107,258	161,827
Gayle (Dibrell), *Coleman*	.....	4	4	34	13,087	549,466
Jim Ned, *Coleman*	1941	2	2	23	5,840	21,862
Novice, *Coleman*	1938	10	11	101	35,277	978,428
Overall, *Coleman*	1928	2	8	35	19,500	1,433,866
Silver Valley, *Coleman*	1941	13	13	274	93,276	212,637
Unclassified, *Coleman*	.....	54	345	1,242	442,165	9,554,563
Eastland-Erath-Comanche Counties, Total	.....	38	543	2,406	863,568	102,148,534
Amity, *Comanche*	1939	.....	61	177	59,560	1,872,526
Sipe Springs, *Comanche*	1939	.....	.....	.....	.....	
Smith-Morgan, *Comanche*	.....	.....	6	48	17,054	
Unclassified, *Comanche*	.....	6	47	52	16,291	
Desdemona, *Eastland-Erath-Comanche*	1918	*	*	*	†129,000	23,777,419
Carbon, *Eastland*	1939	1	7	30	8,112	‡8,112
Ranger, *Eastland*	1917	*	*	*	†600,000	76,456,926
Unclassified, *Eastland*	.....	29	408	2,029	10,006	10,006
Unclassified, *Erath*	.....	2	14	70	23,545	23,545
Fisher County Total	1928	.....	130	1,330	482,836	13,844,010
Bennett (W.-S. Rotan), *Fisher*	1938	.....	2	16	6,138	73,489

West Central Texas—Continued

Field, County	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End of 1943	Year 1943	Cumulative Through 1943
McCaulley, *Fisher*	1941	.....	6	160	48,197	112,188
Rotan (Robinson), *Fisher*	1937	.....	29	224	94,003	1,455,177
Royston (Stevens), *Fisher*	.....	.....	93	930	334,498	12,033,858
Unclassified, *Fisher*	.....	.....	.....	.....	.....	169,300
Haskell County Total	1929	1	11	60	17,928	228,274
Lawson, *Haskell*	1942	.....	1	5	1,826	5,143
Unclassified, *Haskell*	.....	1	10	55	16,102	223,131
Jones County Total	1926	219	755	8,483	2,667,819	25,604,239
Akard, *Jones*	1938	14	29	399	135,251	398,524
Appling, *Jones*	1939	.....	2	12	5,666	71,466
Avoca (Shallow and Deep), *Jones*	1937	42	50	1,464	467,137	2,592,930
Avoca, North, *Jones*	1940	6	6	223	78,814	189,596
Avoca, West, *Jones*	1941	.....	3	64	19,601	38,494
Griffin, *Jones*	1938	44	67	1,544	506,961	2,611,100
Grogan, *Jones*	1942	.....	1	14	5,293	8,131
Hawley, *Jones*	1925	.....	65	250	95,666	3,353,398
Lewis-Steffens, *Jones*	1937	2	183	487	193,017	2,685,248
Noodle, South, *Jones*	1941	6	17	505	111,923	180,895
Reid (Penick), *Jones*	1940	.....	4	16	6,208	34,301
Sayles, *Jones*	1933	22	79	732	264,373	2,640,393
Stith, *Jones*	1940	4	6	69	19,951	45,809
Triplett, *Jones*	1940	.....	3	24	10,298	77,320
Wimberly, *Jones*	1941	73	77	1,688	405,745	615,494
Unclassified, *Jones*	.....	6	163	992	341,915	10,061,340
Palo Pinto County Total	1902	4	130	230	86,913	5,254,291
Shackelford County Total	1910	27	1,986	4,850	1,769,739	46,173,510
Ivy, *Shackelford*	1937	27	82	1,017	357,656	2,234,127
Nail, *Shackelford*	1927	.....	19	276	91,737	679,676
Roark Nail, *Shackelford*	.....	.....	6	78	21,525	
Unclassified, *Shackelford*	.....	.....	1,879	3,479	1,298,821	43,259,707
Stephens County Total	1916	32	616	3,400	1,167,125	131,247,782
Loving, *Stephens*	1939	11	16	182	50,270	192,256
Stribling, *Stephens*	1939	.....	9	45	16,268	196,215
Unclassified, *Stephens*	.....	21	591	3,173	1,100,587	130,859,281
Stonewall County Total	1938	.....	6	105	36,016	200,996
Aspermont, *Stonewall*	1940	.....	2	22	8,214	39,947
Boyd, *Stonewall*	1939	.....	2	17	5,168	34,620
Carlile, *Stonewall*	1938	.....	2	66	22,634	126,429
Taylor County Total	1929	50	88	831	269,780	1,055,800
Bowles, *Taylor*	1939	.....	2	5	2,384	110,061
Merkel, *Taylor*	1941	1	12	257	71,892	129,946
South View, *Taylor*	1940	5	11	73	37,058	195,855
Trent, *Taylor*	1942	.....	2	5	3,617	13,553
Unclassified, *Taylor*	.....	44	61	491	154,829	606,385
Throckmorton County Total	1924	4	245	570	196,881	4,059,901
McKnight, *Throckmorton*	1941	1	2	58	17,361	46,070
Parrott, *Throckmorton*	1941	1	1	36	9,713	20,022
Unclassified, *Throckmorton*	.....	2	242	476	169,807	3,993,809
Wise County Total	1942	.....	1	.....	820	1,443
Total West Central Texas	.....	484	6,852	26,129	8,946,821	389,962,416

* Data for 1943 included below with "Unclassified, Eastland." † Estimated.
‡ Cumulative production prior to 1943 included with Desdemona.

North Texas

Archer County Total	.....	224	3,816	21,335	7,499,144	146,107,291
Burns-Ickert, *Archer*	1943	1	1	58	11,447	11,447
Cooper, *Archer*	1942	5	6	284	62,710	66,450
Hull-Silk-Sikes, *Archer*	1938	154	422	11,300	3,828,466	14,654,701
Hull-Silk-Sikes, Caddo sand, *Archer*	1940	4	17	214	94,692	487,934
Kadane, *Archer*	.....	14	18	591	209,348	547,105
Kadane, Shallow, *Archer*	1941	.....	5	71	24,883	72,702
Mankins, *Archer*	1939	6	14	454	182,315	683,246
Scotland, *Archer*	1938	20	24	803	279,238	524,572
Scotland, Miss. Lime, *Archer*	1941	4	4	209	82,316	142,711
Vogtsberger, *Archer*	1940	7	8	334	89,265	169,330
Unclassified, *Archer*	.....	9	3,297	7,017	2,634,464	128,747,093
Baylor County Total	.....	.....	175	1,903	596,743	6,601,772
Rendham, *Baylor*	1940	.....	13	237	79,071	217,532
Seymour, *Baylor*	1939	.....	36	1,267	388,672	990,725
Unclassified, *Baylor*	.....	.....	126	399	129,000	5,393,515
Clay County Total	.....	101	1,073	7,671	2,583,588	15,588,599
Antelope, *Clay*	1940	49	52	1,474	550,580	1,939,244
Antelope, Miss. Lime, *Clay*	1941	2	2	125	41,444	71,821
Burns-Browning, *Clay*	1939	1	4	54	24,059	206,703
Burns-Midway, *Clay*	1943	2	2	276	39,529	39,529
Halsell, *Clay*	1939	4	11	481	170,861	524,082
Hapgood, *Clay*	1940	2	3	179	67,962	194,891
Joy, Miss. Lime, *Clay*	1941	9	9	1,007	228,707	396,878
Kinder, *Clay*	.....	.....	1	3	1,538	1,538
New York City, Miss. Lime, *Clay*	1941	9	9	348	128,497	269,294
New York City, Strawn sand, *Clay*	1942	.....	1	10	2,958	10,261
Ross, *Clay*	1939	12	20	268	111,399	338,281
Stephens, *Clay*	1943	2	2	213	31,180	47,649
Watson, *Clay*	1942	8	11	165	72,113	98,310
Unclassified, *Clay*	.....	1	946	3,068	1,112,779	11,450,118
Cooke County Total	.....	25	1,213	10,498	3,398,101	29,222,274
Bindel, *Cooke*	1941	.....	3	47	21,546	68,666
Bindel, Ellenburger, *Cooke*	1943	2	4	185	41,333	41,333
Voth, *Cooke*	1939	.....	57	282	116,291	887,755

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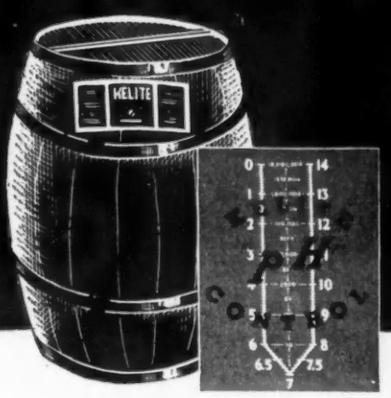
A barrel of Man Hours



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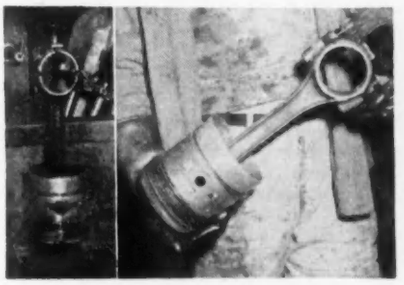

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North Texas—Continued

Field, County	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End 1943	Year 1943	Cumulative Through 1943
Walnut Bend, *Cooke*	1938	1	130	4,629	1,673,689	5,586,872
Walnut Bend Winger, *Cooke*	1943	22	23	1,881	323,082	323,082
Wilson, *Cooke*	1941	.....	7	93	26,768	56,519
Unclassified, *Cooke*	....	.....	989	3,381	1,195,392	22,258,047
Denton County Total	....	.....	.....	.....	1,099	17,779
Bolivar, *Denton*	1937	.....	.....	.....	1,099	17,779
Foard County Total	....	1	15	175	65,303	2,117,736
Johnson, *Foard*	1933	1	10	151	54,589	1,739,309
Unclassified, *Foard*	....	.....	5	24	10,714	378,427
Grayson County Total	....	.....	3	5	2,258	47,075
Collinsville, *Grayson*	1938	.....	1	2	1,236	37,986
Pottsboro, *Grayson*	1930	.....	2	3	1,022	9,089
Jack County Total	....	58	761	5,610	1,935,521	22,499,658
Bryson, *Jack*	1915	.....	.....	.....	.....	.....
Bryson, E., *Jack*	1940	24	151	2,162	799,554	18,970,643
Ellis, *Jack*	1943	8	8	349	89,794	89,794
Hoefel, *Jack*	1941	11	18	731	221,910	353,380
McDonald, *Jack*	1943	1	2	115	18,663	18,663
Myers, *Jack*	1941	.....	5	85	31,800	57,429
Peek, *Jack*	1943	1	1	76	16,757	16,757
Taubert-McKee, *Jack*	1942	.....	1	16	4,049	7,066
Webb, *Jack*	1942	1	1	2	850	3,508
Weir, *Jack*	1943	.....	2	89	8,678	8,678
Wolfe, *Jack*	1943	.....	1	86	11,741	11,741
Worsham-Steed, *Jack*	1942	.....	2	74	27,308	42,807
Unclassified, *Jack*	....	12	569	1,825	704,417	2,919,192
Montague County Total	....	85	1,101	9,333	3,367,604	42,003,320
Benson, *Montague*	1941	2	3	32	16,019	58,573
Bonita, *Montague*	1940	11	17	673	260,961	882,115
Bowers (Field-Bowers), *Montague*	....	11	35	957	351,894	1,018,053
Chapman-McFarlin, *Montague*	1941	.....	1	53	19,698	44,593
Clingingsmith, *Montague*	1941	.....	5	120	48,523	140,572
Dodson, *Montague*	1943	12	12	485	106,433	106,433
Forrestburg, *Montague*	1942	3	6	233	117,848	206,698
Hildreth, *Montague*	1942	8	8	751	160,516	165,129
Hults & Owens, *Montague*	1940	1	1	20	14,302	93,739
Illinois Bend, *Montague*	1943	2	3	174	38,611	38,611
Mueller, *Montague*	1942	2	2	60	28,555	58,478
Mueller, Caddo, *Montague*	1943	2	2	183	39,471	39,471
Ringgold, *Montague*	1940	9	15	651	263,669	604,486
Rodgers & Rodgers, *Montague*	1939	16	39	894	363,939	2,010,674
Sanders, *Montague*	1942	2	4	234	85,841	165,238
Stoneburg, *Montague*	1942	2	5	119	43,637	60,106
Turner, *Montague*	1941	1	1	13	7,179	22,127
Unclassified, *Montague*	....	1	942	3,681	1,400,508	36,288,224
Wichita County Total	....	1,060	7,161	39,659	14,631,143	389,840,611
Airport, *Wichita*	1943	.....	1	80	11,703	11,703
Burkburnett, *Wichita*	1912	.....	*	†3,800	†1,750,000	159,557,256
Davidson, *Wichita*	1943	.....	1	104	13,463	13,463
Electra, *Wichita*	1911	.....	*	†5,400	†2,000,000	146,867,199
K.M.A.-Iowa, *Wichita*	1913	928	1,599	21,122	7,875,508	77,594,778
K.M.A., Deep, (Ellenburger), *Wichita*	1940	125	165	7,992	2,923,774	5,720,003
West, *Wichita*	1943	3	3	242	29,149	29,149
Unclassified, *Wichita*	....	4	5,392	919	27,546	47,060
Wilbarger County Total	....	35	1,675	11,163	3,891,821	80,603,178
Consolidated, *Wilbarger*	1939	10	39	611	230,293	61,928,477
Electra, South, (Ellenburger), *Wilbarger*	1941	.....	2	28	9,571	29,085
Fargo, *Wilbarger*	1940	3	50	33,383	1,179,684	2,250,203
Harrold, *Wilbarger*	1941	1	13	286	99,802	209,540
Potts, (Ellenburger), *Wilbarger*	1942	.....	2	24	11,185	27,846
Rock Crossing, (Ellenburger), *Wilbarger*	1941	4	7	309	94,945	142,435
Unclassified, *Wilbarger*	....	17	1,562	6,522	2,266,341	16,015,592
Young County Total	....	176	2,414	9,800	3,535,132	82,280,057
Briar Creek, *Young*	1941	5	8	175	54,196	125,247
Burns-Larrimore, *Young*	1941	1	4	62	21,850	64,865
Burns-Ragland, (Miss. Lime), *Young*	1941	5	5	218	106,123	125,467
Fish Creek, *Young*	1943	3	3	11	1,302	1,302
Garvey, *Young*	1942	.....	2	56	19,983	32,045
James, *Young*	1917	16	47	385	143,780	2,965,848
Kerlyn-Loving, *Young*	1942	.....	3	36	13,193	29,267
Knox, *Young*	1939	9	25	243	84,574	910,526
Knox, North, (Caddo), *Young*	....	14	20	351	127,364	
Knox, (Miss. Lime), *Young*	1942	3	4	344	104,344	106,976

North Texas—Continued

Field, County	Year of Discovery	Oil Producing Wells at End of 1943		Crude Oil Production (Barrels)		
		Flowing	Total	Daily at End 1943	Year 1943	Cumulative Through 1943
Padgett, *Young*	1942	5	5	113	84,559	111,789
Taylor, (N. Loving), *Young*	1941	1	2	10	2,940	12,254
Williamson, *Young*	1941	.....	5	117	50,001	128,590
Unclassified, *Young*	....	114	2,281	7,679	2,720,923	77,665,881
Total North Texas	....	1,765	19,407	117,152	41,507,457	816,929,350

* Included below with "Unclassified, *Wichita*." † Estimated.

Utah

*San Juan, *San Juan*	1910	.....	.....	.....	.....	14,000
Virgin, *Washington*	1908	.....	5	15	6,300	191,300
Total Utah	....	.....	5	15	6,300	205,300

* Abandoned in 1942.

West Virginia

Total West Virginia	....	.....	17,400	8,500	3,338,000	421,115,000

Wyoming

Badger Basin, *Park*	1931	4	4	85	34,910	505,297
Big Medicine Bow, *Carbon*	1935	.....	7	693	235,737	4,274,925
Big Muddy, *Converse*	1915	.....	140	1,096	382,663	27,797,764
Black Mt., *Hot Springs*	1925	.....	8	30	6,107	292,502
Byron, *Big Horn*	1906	.....	28	7,504	2,452,929	9,962,112
Circle Ridge, *Fremont*	....	.....	10	833	250,568	310,373
Cole Creek, *Natrona*	1938	.....	29	1,213	419,525	795,014
Dallas Derby, *Fremont*	1883	.....	34	427	159,152	3,444,406
Dutton Creek, *Carbon*	1927	.....	3	46	16,785	323,015
Elk Basin, Light, *Park*	1915	.....	*141	*392	*159,331	†11,737,850
Elk Basin, Heavy, *Park*	1942	3	18	11,474	2,161,093	2,169,549
Ferris, *Carbon*	1918	.....	2	16	5,901	566,422
Frannie, *Park*	1928	.....	*30	*1,908	*1,000,992	†7,767,105
Garland, *Big Horn*	1930	.....	18	1,178	396,350	5,602,577
G. P. Dome, *Carbon*	1943	.....	2	54	1,700	1,700
Gooseberry, *Park*	....	.....	1	3	7,015	20,170
Grass Creek, *Hot Springs*	1914	.....	339	2,634	1,351,889	32,562,425
Graybull, *Big Horn*	1907	.....	‡17	‡	‡	346,730
Hamilton, *Hot Springs*	1913	.....	33	252	443,209	6,426,366
Hidden Dome, *Washakie*	1933	.....	16	37	13,289	391,834
Horse Creek, *Laramie*	1943	.....	1	15	11,929	11,929
Hudson, *Fremont*	1914	.....	35	243	86,000	2,405,677
Iron Creek, *Natrona*	1922	.....	4	13	3,230	31,510
LaBarge, *Sublette*	1923	.....	141	1,645	624,079	8,648,115
Lance Creek, *Niobrara*	1918	150	220	19,220	7,192,183	57,063,337
Lost Soldier, *Sweetwater*	1915	.....	48	5,637	1,994,941	22,612,507
Mahoney, *Carbon*	1930	.....	9	776	290,004	1,437,321
Maverick Springs, *Fremont*	1922	.....	35	1,441	566,336	1,819,833
Midway, *Natrona*	1930	.....	‡2	‡	‡	175,886
Mule Creek, *Niobrara*	1919	.....	42	318	112,070	1,559,789
Notches, *Natrona*	1923	.....	5	310	115,711	327,535
Oregon Basin, *Park*	1927	.....	107	15,054	4,922,704	28,426,841
Osage, *Weston*	1920	.....	198	500	182,000	5,190,703
Pilot Butte, *Fremont*	1916	.....	13	1,258	465,271	1,208,434
Quealy	1934	.....	17	395	153,846	153,846
Rex Lake, *Albany*	1923	.....	3	150	21,132	292,492
Rock Creek, *Carbon*	1918	.....	52	2,526	908,037	22,619,436
Salt Creek, *Natrona*	1908	6	1,781	13,016	4,802,679	308,405,017
Shoshone (Cody), *Park*	1929	.....	2	79	29,148	108,077
Sheep Creek, *Fremont*	....	.....	2	15	957	957
South Casper Creek and Poison Spider, *Natrona*	1920	.....	36	713	263,500	4,224,776
Spindletop, *Natrona*	1928	.....	4	17	8,558	34,458
Steamboat Butte, *Fremont*	1943	.....	3	739	200,987	200,987
Teapot (outside Naval Res.) *Natrona*	1927	.....	2	13	4,243	127,924
Warm Springs, *Hot Springs*	1917	.....	28	102	27,167	436,667
Wertz, *Carbon*	1936	23	23	5,666	2,069,492	7,281,304
Total Wyoming	....	186	3,674 ‡‡3,693	99,646	34,555,349	591,107,986

* Including part of field lying in Montana. † Including production in 1943 in Montana part of field. ‡ Shut in. ‡‡ Including 19 wells shut in.

Industry reorganized under a federal agency that controls every activity from drilling and production, to shipments, refining and disposition.

Oil Operations Geared to War Conditions Through PAW

THIRTY-ONE months of federal direction has seen a complete reorganization of the American oil industry, gearing it to a war in which petroleum is a major weapon.

Technical and operational practices have been reformed, the civilian consumers have been regimented; from the drilling of the wildcat to the filling of the automobile tank, every activity of the industry has been regulated from Washington.

In addition to controlling the movement and disposition of every barrel of oil produced, refined, transported and consumed, the government has channeled research in the industry into new fields vital to the conduct of the war but which will be of vast importance in the peacetime to come. New super gasolines and synthetic rubber are but two of the products which may strengthen the backbone of the industry when it converts back to normal operations.

Control of the oil industry has been divided among five federal war agencies. The most important, of course, is the Petroleum Administration for War, but its operations have been meshed into those of the War Production Board, the Office of Price Administration, the Office of Defense Transportation and the War Shipping Administration, which have jurisdiction, respectively, over oil-industry materials, prices, overland transportation and tankers.

Orders of the other agencies have been, to steadily increasing extent, based upon recommendations of PAW, which is most intimately linked to the industry since, both under its own authority and as agent for WPB, it directly controls the actual activities of production operator, refiner, transporter and marketer.

PAW came into existence as the Office of Petroleum Coordinator for National Defense, created by an executive order issued by President Roosevelt May 28, 1941, with Secretary of the Interior Harold L. Ickes as coordinator. It became the Petroleum Administration for War shortly before Pearl Harbor, under an executive order of December 2.

Organization

When OPC was set up, its initial major concern was to insure an adequate supply of oil for the civilian population and the defense program in the Eastern States. It had other problems added as weeks went by—but it also had six months in which to lay the foundation for its war activities.

Entrusted by the President with the task of "coordinating" the oil industry, Ickes immediately went to the oil companies, large and small, for the men to head the organization and invited the whole industry to come to Washington for a "get together" meeting at which, more successfully than either Ickes or industry leaders had anticipated, laid the foundation of mutual cooperation which has made PAW the most successful of all wartime control agencies.

Out of the general meeting came the many district and industry committees which deal wih various problems as they arise and a coordinating committee of some 72 members, which never operated as such but, meeting for the first time on the day after Pearl Harbor, adopted the title of Petroleum Industry War Council and became general advisor to PAW.

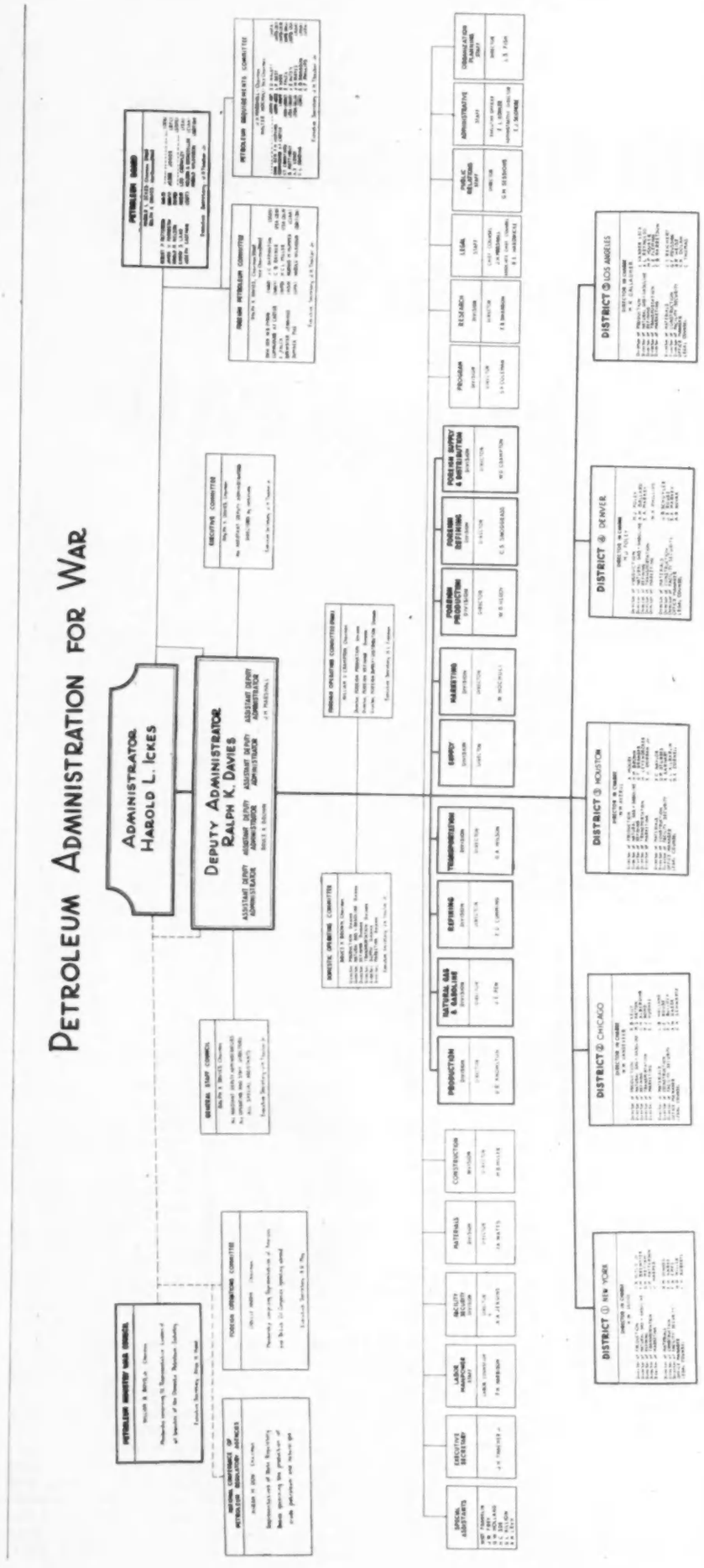
As the full weight of the war struck, and as more intensive far-flung fighting developed, the problems of the agency multiplied rapidly. Some of the problems of supplying the exact amount of

HAROLD L. ICKES
Petroleum Administrator for War

Born in Blair County, Pennsylvania, March 15, 1874; lawyer by profession; one-time newspaper reporter; author; prominent in Illinois Progressive and Republican politics for many years and unsuccessful candidate for the United States Senate in 1926; appointed Secretary of the Interior March 4, 1933; is also Solid Fuels Administrator for War and member of War Production Board, Capital Auditorium Commission, Smithsonian Institution, Migratory Bird Conservation Commission, National Archives Council, National Forest Conservation Commission, National Power Policy Committee and National Park Trust Fund Board; president of Petroleum Reserves Corporation; was Administrator of Petroleum Code during NRA period; appointed petroleum administrator when President Roosevelt created bureau May 28, 1941.

RALPH K. DAVIES
Deputy Petroleum Administrator

Born in Cherrydale, Virginia, 47 years ago; with Standard Oil Company of California since age of 17, now senior vice president on leave of absence; in 1928 was loaned to Anglo-American Oil Company of London, to undertake reorganization of company, spending two years abroad; organized and was president of Standard Oil Company of British Columbia, Canadian operating subsidiary of Standard Oil Company of California; member of National Marketing Committee under NRA oil code, 1933-35, aiding in formulation and administration of Pacific Coast Petroleum Agency; is director of Standard Oil Company of California and Standard Oil Company of British Columbia, California Pipe Line Company, Standard Pipe Line Company and Coast Counties Gas and Electric Company; vice president of Pacific Public Service Company; president of Standard Stations, Inc.; appointed Deputy Adminstrator June 9, 1941.



petroleum products of the right quality, at exactly the right time and place, can never be met under rapidly changing conditions of war; but PAW and the industry have to their credit some remarkable accomplishments. Among them have been:

The revolutionary readjustments to cope with the complete distribution of petroleum transportation to the East Coast area when tankers were withdrawn for war service. Turning first to railroad shipping, the industry-government team in the past 18 months has built a vast network of pipe lines across the continent that is providing supplies at Atlantic ports for shipment to European war fronts.

To take care of extraordinary war demands for special petroleum products, including vital products like aviation gasoline, raw materials for synthetic rubber and explosives, many new plants have been constructed, processes have been perfected, and the operation of older plants adjusted to wartime needs.

Departmentalized

To deal with these, and other, problems PAW was departmentalized, each division has its specific field, and the country was divided into five districts, each with a district office—a little PAW staffed to deal quickly with local problems.

The blueprint of PAW called for nine major divisions; production, reserves (recently consolidated with production), petroleum supply, foreign operations, materials, natural gas and natural gasoline, refining, transportation, and marketing. Within the past year, two new divisions have been added: manpower and program.

Each of these divisions operates independently within its own sphere, subject to the general direction of the administrator's office, and in cooperation with other divisions whenever joint problems arise. Their problems and accomplishments are summarized later in this article.

Because all operations of the oil industry are closely related and all its products essential to some phase of the war effort, virtually every activity of every branch of the industry has come under the direction of PAW.

To make that direction effective, yet as simple as the complexities of the many war programs permit, PAW's organization follows the same main branches of business and functions which the industry itself built up in the course of its normal development. Thus, there are divisions of production, transportation, refining, marketing, statistics, foreign operations and the like, just as they would be found in any company engaging in every phase of

GOOD NEWS FOR THE OIL INDUSTRY!

Axelson *is building* *more* *pumps*

EACH MONTH WE'RE GETTING MORE MATERIAL WHICH ENABLES US TO STEP-UP AND SPEED-UP THE AMOUNT OF DELIVERIES

Not so long ago, we celebrated when a little batch of raw materials trickled into our plant and enabled us to build a few more pumps, or to replace parts on old ones. It was discouraging, but there was little or nothing to be done about it. The War Materials Board told us what we could have—and that was that!

Lately, however, the picture has changed as a result of requirements from the War and Navy Departments. They must have oil to run our rapidly expanding fleet; they must have high test gasoline to keep our incomparable bombers and pursuit ships in the air. War plants, munitions factories, engine builders are all demanding more oil, lest their machinery be shut down.

The red light has turned green; the regulations have been eased up a little more each month. So, Axelson is again in a position to step-up production. We are now making more pumps—not enough to meet the entire demand, as yet—but more than we made six months ago. We think this condition will steadily improve.

Meanwhile, our designers and engineers have performed miracles in creating new methods, using alternate materials—but never budging one iota from the traditional Axelson quality. We still believe we have the world's best pumps—and fifty years of experience have proved we're right!

Are you using any Axelson R.S.L. Pumps now?

Every pump manufacturer makes a Tube Type pump—but we believe Axelson R. S. L. type is the best insert pump made for all-over universal pumping requirements where the use of a rod type pump is indicated. These pumps are available in either traveling or stationary barrel types.

The patented Axelson top lock-hold-down, developed to provide positive anchorage and to prevent sandpacking in stationary barrel pumps, may also be used with the traveling type through the substitution of one part. In other words, by substituting a valve type manderel for the standard manderel in the hold-down, a traveling type pump can either be hung from the end of the tubing or can be set in the shoe above the end of the tubing. This is a typical feature, indicative of Axelson pump superiority. If you are not familiar with the various types and application of the Axelson R. S. L. pump, write for full particulars today.

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BRUCE K. BROWN
Assistant Deputy Administrator

Former research chemist and lawyer, entered oil business in 1929 as general patent attorney for Standard Oil Company (Indiana), later in charge of petroleum research and development and member of board of directors, resigning in 1942; joined PAW in December, 1941, as consultant on aviation gasoline problems, and appointed assistant deputy coordinator in July, 1942.

the oil business throughout the world.

The same chart has been followed in the organization of the five district offices, with such modifications as may be advisable in the light of local activities—there being no need of a foreign operations division, for instance, in the regional set-up.

All of the machinery for the exercise of wartime control is in PAW but much of the motive power comes from the Petroleum Industry War Council and the many committees that have been set up. All branches of the industry, all sections of the country and all sizes of companies, as well as some 15 trade associations, are represented on PIWC. In each district, there are five committees on production, refining, transportation, marketing and natural gas and natural gasoline; PIWC itself has a number of committees and subcommittees, each dealing with a specific subject.

While the membership of the advisory groups is large, there is none of the delay and inefficiency which usually marks the conduct of business by committees, but through them the industry in general is given an opportunity to discuss policies and procedure. And both PAW and the committees have shown that, when an emergency arises, they can deal with problems quickly and effectively, often by agreement and without formal order.

ROBERT E. ALLEN
Former Assistant Deputy Administrator

Entered oil business as toolpusher and roustabout in West Virginia; with Continental Oil Company to 1929; consulting engineer and associated with oil conservation activities since 1929, when he was assistant oil umpire of California and executive secretary of Central Conservation Committee of California; later was chairman of Petroleum Conservation Board of Alberta, Canada; joined PAW in July, 1941, as director of production. This division of PAW set up by him; appointed assistant deputy administrator in January, 1942; resigned September, 1943, to become public relations director of American Petroleum Institute.

Personnel

In no other federal war agency controlling and directing industry is the regulated industry as fully represented as in the Petroleum Administration for War.

In fact, PAW is a definite segment of the industry it regulates, for hundreds of oil executives, engineers and scientists have been drafted to serve with or for it—either directly in the government organization or on the many committees and PIWC.

ERIC L. KOHLER
Executive Officer

Former consulting accountant in Chicago; comptroller of Tennessee Valley Authority, 1938-41; joined War Production Board office of operations, 1941; appointed executive officer, PAW, December, 1942.

JOHN H. THACHER, JR.
Executive Secretary

Instrument man on geological survey party in Oklahoma, 1925; graduated in geology at Princeton University, 1930; employed as petroleum engineer by Standard Oil Company of California, 1930-35; served in land and lease division, 1936; later became assistant to manager of company's natural gas division; selected for Alfred P. Sloan Fellowship in business and engineering administration at Massachusetts Institute of Technology in 1941; awarded M.S. degree one year later; joined staff of executive office of WPB; joined PAW six months later as consultant to director of Natural Gas and Natural Gasoline Division; appointed executive secretary of PAW and special assistant to deputy administrator, April, 1943.

THOMAS J. QUINN
Assistant Executive Secretary

Member of administrative staff and advisor on economic problems of American Petroleum Industries Committee for past 8½ years; joined PAW in May, 1943; he assists executive secretary in servicing major industry, governmental and internal committees.

J. HOWARD MARSHALL
Assistant Deputy Administrator and Chief Counsel

Former assistant dean, Yale University School of Law; member of Petroleum Administrative Board in NRA period; served as assistant solicitor, Interior Department and Special Assistant to Attorney General; was member of Federal Tender Board for East Texas oil fields; member of law firm of Pillsbury, Madison and Sutro, San Francisco.

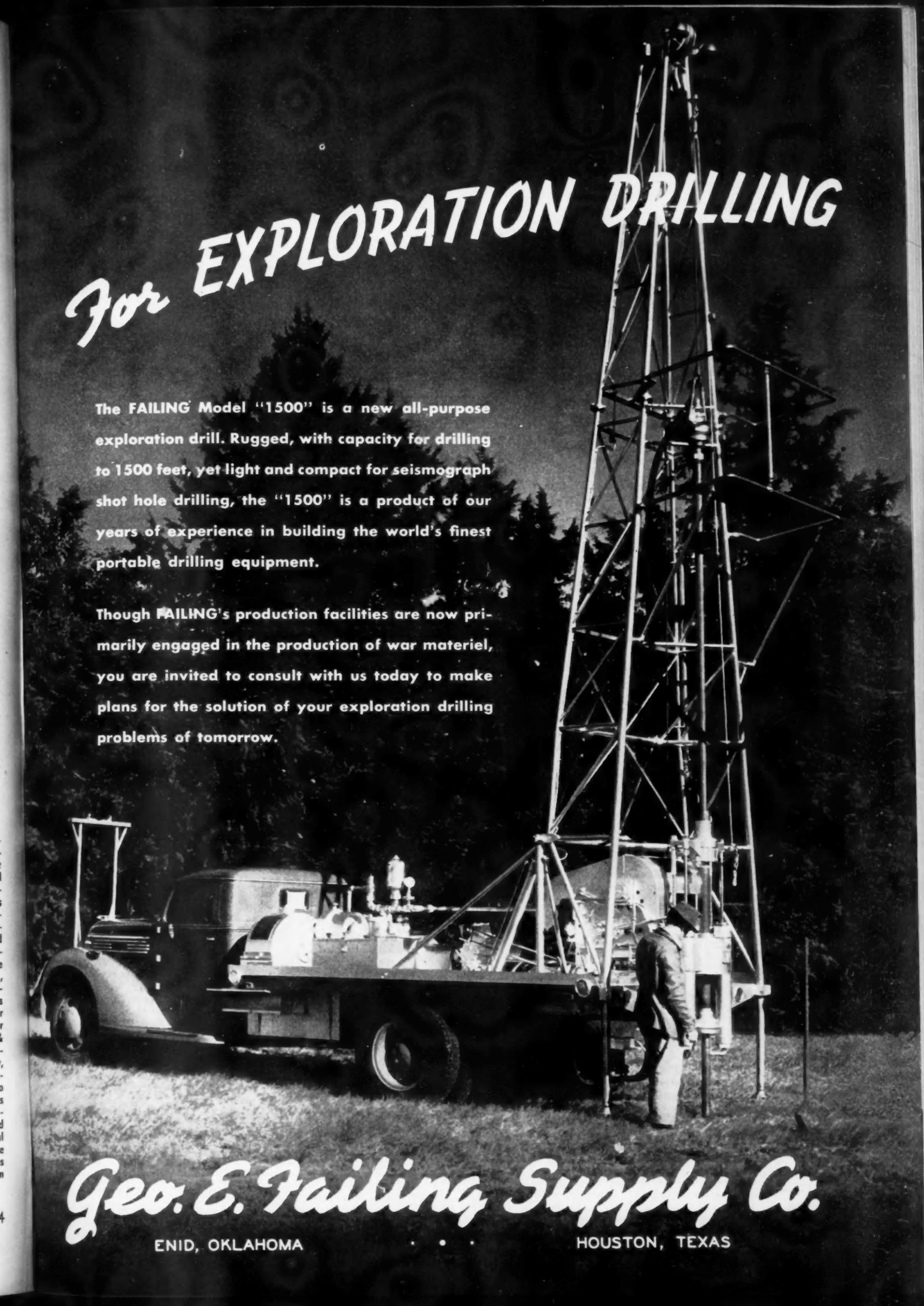
With the announced policy of closing up shop just as soon as possible after the end of the war, Administrator Harold L. Ickes has consistently sought to avoid building up a bureaucracy of professional office holders who would naturally seek to make their jobs permanent. Instead, he asked oil companies throughout the country, major and minor to release their best men to the government, knowing that they would be eager to return to their civilian activities as soon as possible.

Because the men who staff PAW came to Washington to do a job and are not interested in either a government position nor the bright light of publicity, the organization has been, for Washington, remarkably stable. A few of the men entered PAW to serve a stipulated time or accomplish a specific objective and resigned when their agreement expired, but there has been a complete absence of the joggling of jobs from one man to another which has marked other agencies.

Thus, PAW is an oil man's organiza-

E. L. DeGOLYER
Former Assistant Deputy Administrator

Former member of United States Geological Survey; then chief geologist of Mexican Eagle Oil Company, 1909-14; entered consulting business in United States, identified with early geophysical work; organized Amerada Petroleum Corporation, served as vice president, president, chairman, 1929-32; engaged in oil business as independent operator and consulting geologist-engineer; is senior member of firm of DeGolyer, MacNaughton & McGhee, Dallas; appointed director of conservation (now reserves division) for PAW, July, 1941; appointed assistant deputy administrator, June, 1942; resigned September, 1943, to be special consultant to Petroleum Reserves Corporation. Former president of both American Association of Petroleum Geologists and American Institute of Mining and Metallurgical Engineers; recipient of distinguished service award from Texas Mid-Continent Oil & Gas Association, Lucas medal of AIME, and John Fritz medal of AIME.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HERBERT CHANDLER IDE
Executive Assistant to Deputy Administrator

Joined Standard Oil Company of California, 1935, worked in manufacturing department, pipe-line, clerical and accounting activities at marine terminal; served as assistant to company's special legal and economic counsel, 1936-37; assistant to general manager of transportation, June, 1937, to January, 1938; assistant to vice president and director of company, February, 1938; joined PAW as assistant to deputy petroleum administrator, August, 1941; appointed special assistant to deputy administrator, December, 1942; made executive assistant to deputy administrator, November, 1943.

JOHN W. FREY
Special Assistant to Deputy Administrator

Member of faculty, University of Wisconsin, 1920-28; petroleum section, Bureau of Foreign and Domestic Commerce, 1928-33; marketing advisory to Deputy NRA Administrator, 1933; joined Department of Interior, 1933, as member Petroleum Administrative Board; associate director for refining and marketing, Petroleum Conservation Division, 1936-41; appointed director of marketing, OPC, August, 1941; appointed special assistant to deputy coordinator, July, 1942.

GEORGE W. HOLLAND
Special Assistant to Deputy Administrator

Government career man, with more than 30 years in federal service in the General Land Office, Geological Survey, temporarily retired from post as director of Petroleum Conservation Division held since December, 1935; worked with General Committee of California Producers during NRA, later becoming chairman of the Petroleum Administrative Board which was converted into Petroleum Conservation Division.

GEORGE L. KILLION
Special Assistant to Deputy Administrator

Born in Steamboat Springs, Colorado; engaged as public relations and legislative counsel, Safeway Stores, Inc., Oakland, California, 1935-39; deputy director of finance, State of California, 1939-40; secretary to Governor of California, 1939; director of finance, state of California, 1940-43; commissioned major in specialist reserve, A.U.S., 1943; joined PAW, August, 1943.

tion, free of the pulling and hauling for temporary power and the domination of lawyers and college professors which drew sharp criticism upon the Office of Price Administration and other agencies.

And, because it was a practical organization devoting itself to the quick solution of immediate problems and giving no thought to post-war reforms, PAW has been able to attract some of the best men in their respective fields of effort, men who knew the salary offered by the government would not pay the income tax on what they could make in private life.

Materials Division

THE materials division was set up in the summer of 1941, when the priorities system was developed under which procedures were established for petroleum operators to obtain critical items of machinery required for their activities.

One month before Pearl Harbor it was determined that materials were so critically needed for the war program, that petroleum industry use should be restricted. This led to the issuance of the M-68 order, December 23, 1941, which reduced drilling operations by 40 percent and a need for materials by a like amount.

Preference Rating Order P-98-b was then prepared as a means of perfecting the distribution of materials for petroleum operations authorized under Order M-68, the effect of the latter being that petroleum operators, equipment distributors, equipment manufacturers and oilfield-supply companies had on hand approximately enough material with which to conduct production operations through 1942.

During this period construction op-

ROBERT E. HARDWICKE
Associate Chief Counsel

Began practice of law in Beaumont, Texas, 1911; became member of legal staff of Gulf Oil Corporation, 1918, being located in Texas, 1918-23, and in Venezuela, 1923-29; resigned 1929 to enter general law practice at Fort Worth; continued general practice until July, 1943, at which time became special counsel for PAW with offices in Houston; was transferred to Washington, November, 1943, becoming associate chief counsel. Author of two books: "Innocent Purchaser of Oil and Gas Leases," 1921; and "Petroleum and Natural Gas Bibliography," 1937; also author of various articles on oil and gas law.

WIRT FRANKLIN
Special Field Assistant

Independent oil operator; joined PAW in fall of 1941 as district director of production and director in charge of District 2; appointed special field assistant to Deputy Administrator July, 1943, to assist in developing increased exploration, installation of secondary-recovery operations and adoption of conservation practices; has been prominent in wildcatting for more than three decades, his activities leading to the discovery of the Healdton and the Oklahoma City; one of the founders and first president of the Independent Petroleum Association of America; chairman of the planning and coordination committee under the NRA code.

WILLIAM F. HUFF
Former Special Consultant to Deputy Administrator

Engaged in public utilities prior to enlistment as private in Army of last war; was promoted to second lieutenant; engaged in oil production after war; joined The National Supply Company as assistant sales manager and western export sales manager in 1921; vice president and secretary-treasurer of Bettis Rubber Company 1935-38; manager of tubular sales, Petroleum Equipment Company, 1938-42; joined PAW as director of material division in January, 1942; in July appointed special consultant in preparation of petroleum-industry inventory program; resigned November, 1942, to return to private business in California.

J. ELMER THOMAS
Former Special Assistant to Deputy Administrator

Independent operator and geologist; past president of American Association of Petroleum Geologists; connected with numerous oil companies as geologist; did extensive exploration in Western Europe as vice president and general manager, Bavarian Oil & Gas Company; chairman, committee on petroleum economics, Federal Oil Conservation, 1930; special technical advisor to NRA oil administrator and member of Petroleum Administrative Board, 1933; petroleum economist and geologist, Fort Worth and Houston, 1933-1941; appointed advisory consultant to OPA's fuel section, July, 1941; then joined PAW as special assistant to deputy administrator; returned to private practice as oil operator and geologist, 1943.

JUSTIN R. WOLF
Assistant Chief Counsel

Born in Philadelphia, 1911; joined legal staff of Federal Power Commission, 1937; joined OPC legal staff, September, 1941.

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erations, particularly refining, were slightly increased, making it necessary that priorities orders and regulations be followed in acquiring materials for those operations.

On January 4, 1943, authority to administer Order M-68 was delegated by WPB to PAW, where the order was reissued as PAO-11. During the first quarter of 1943, the Controlled Materials Plan was made effective and PAW was delegated as claimant agency for materials required for petroleum construction, production and maintenance, repair and operation; at the same time, PAW was appointed industry division for the petroleum equipment manufacturers.

During the second quarter of 1943, materials were distributed partially under the short-lived Production Requirements Plan, under the Controlled Materials Plan and through preference rating procedures.

During and since the third quarter of last year, controlled materials (carbon steel, alloy steel, copper and aluminum) have been distributed under the Controlled Materials Plan, while the preference rating system, including Order P-98-b (formerly P-98), was used as a medium for effecting the distribution of component items. During May, 1943, Order P-98-b was amended to coincide with the requirements of the Controlled Materials Plan; since that date it has been re-issued on two occasions to simplify the order and adapt it to changes in CMP.

During the first quarter of 1943, when inventories of production operators and their supplies became depleted, it was necessary to begin to increase the delivery of materials for these operations. The flow of materials for production operations was increased still further during the second and third quarters, reaching a wartime high during the fourth quarter.

As production operations and resultant materials requirements have increased, construction operations have decreased, with the net result that the total petroleum industry requirements for materials were relatively uniform through 1943. Materials under the CMP are being made available for operations at the approximate rate at which they are required, with preference rating procedures used to expedite the delivery of bottleneck items.

It is anticipated that materials generally will be available during 1944 for all essential petroleum operations, but that a national shortage of materials will make it necessary to expedite the delivery of some materials, and for petroleum operators to continue to use their ingenuity in filling many of their needs.

FRANK A. WATTS
Director, Materials Division

Born Los Angeles; joined Union Oil Company of California as construction engineer, 1919; joined Humble Oil & Refining Company, 1919, becoming purchasing agent with headquarters in Houston, 1938; member, American Petroleum Institute, National Purchasing Agents Association, American Society of Architects, Houston Engineers Club, American Legion; appointed director, PAW materials division, January, 1943.

GREER W. ORTON
Former Director of Materials

With The Texas Company since 1928, serving as assistant manager of purchasing department, when drafted by PAW; succeeded William Huff as director of materials when Huff appointed special consultant to deputy administrator; served from June 22, 1942 to February 1, 1943.

ROBERT R. McLACHLEN
Assistant Director, Materials Division

Born in Washington, D. C.; has had varied business experience, initially in banking, with McLachlen Banking Corporation, Washington, and Security First National Bank, Los Angeles; roustabout, chart reader and chemist, Hi-Power Gasoline Company, Breckenridge, Texas, 1922-23; with F. V. Gordon, Los Angeles, oil investments, 1923-28; secretary, director, manager of land lease department and assistant superintendent of production and drilling, Westates Petroleum Corporation, Los Angeles, 1928-36; also general manager, Loscal Petroleum Company, Los Angeles, 1924-36; operated in oil lands and leases, 1937-38; vice president and secretary, Diversified Royalties, Ltd., Los Angeles, 1938-41, and special work for manufacturers, bankers, lawyers and oil companies, 1941; joined War Production Board as senior priorities specialist, January, 1942; principal priorities specialists in charge of staffs assigned to OPC and various WPB divisions, and priorities officer, distribution officer and controlled materials officer assigned to PAW; joined PAW as assistant director of materials, June, 1943.

MERCER H. PARKS
Assistant Director of Materials

Joined Humble Oil & Refining Company in 1928 as petroleum engineer, and has served in this capacity since that date except for a period in 1932-34 when he was with The Carter Oil Company as division engineer; will join PAW in Washington as assistant director of materials February 1, 1944, and will devote his time to internal combustion engines, one of the most troublesome material problems of the oil industry.

Production Division

A MAJOR problem confronting PAW was that of providing the oil to make the products which it was foreseen the military forces would require, as well as needed for the civilian and industrial fronts, a problem which was a rude denial of the fallacious concept held not only by the general public but by members of the industry itself.

Even today, in the face of all that has happened, the myth of limitless resources still is raised occasionally, but the experienced oil men who headed the production division started out with the firm belief that if an adequate and continuous supply of oil was to be provided, it was necessary to maintain a program of continuous exploration and development.

To this end, every effort has been directed toward presenting the true situation with regard to productive capacity, current and future, to those responsible for allocating steel and equipment and to all other agencies that had any relation to the crude oil program.

This educational program resulted in obtaining 60 percent of the 1941 steel requirements for 1942 instead of the 0 percent which WPB had intended to allocate—an outstanding feat in the face of strong and well-supported demands that steel must go first to guns, tanks, ships and other products which could be used directly for war purposes.

Naturally, with an insufficient volume of steel available to the production branch of the industry it was necessary to establish a means for utilizing what was available to the greatest advantage. It was considered fundamentally essential to expand exploration activities and to develop the known crude reserves in the best manner to make them available with the limited quantity of steel. To accomplish this, Conservation Order M-68 was devised.

This order, together with the supplementary orders in the series and the later PAO-11, have served to prevent indiscriminate waste in the use of steel. As steel has become more readily available the restrictions on drilling have gradually been relaxed, although the primary objective of obtaining the greatest return in oil for the steel expended has always been maintained.

It was realized, of course, that a blanket order would not be practical for all the oil-producing regions, so flexibility was obtained by making provision for granting exceptions to the order on the presentation of sufficient support. At first, complaints were heard about the confusion and "red tape" connected with applications for exception, but as the industry became acclimated to the

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impact of war and the necessary stringent control of material these complaints diminished. With the further area relaxation of spacing provisions and the delegation of authority to grant exceptions to the district offices, it may be said that matters have approached the routine.

By obtaining the requisite amount of steel and equipment to maintain drilling at a basic minimum safe level, the production division has served to minimize the decline in productive capacity. By keeping within the limits of the WPB allocations it has assisted the industry in saving a considerable amount of steel for other war uses—two accomplishments of major importance.

With the disruption of transportation facilities following our entrance into active warfare it became necessary to regulate the amounts of crude oil which it appeared advisable to produce from each of the states. This was accomplished by certifications to the state authority, based on careful analyses of supply, demand, transportation and productive ability, which served to make possible full utilization of refineries converted to war products manufacture and assisted in the coordination of all facilities by PAW.

These certifications, in the form of recommendations which were given highly cooperative consideration by state officials, aided in particular in getting large volumes of the proper types of crude oil to the right places at the right time. As transportation facilities improved, increasingly higher production rates were certified to those states capable of producing additional oil, and today we are producing at an all-time peak, a level which can be increased only by the installation of additional transportation facilities in West Texas, the sole remaining area in the nation which has a substantial excess in productive capacity.

The institution of these certifications in conjunction with the cooperation of the other PAW divisions, the grand assistance of the industry and the state regulatory authorities, have made it possible for every war products refinery to secure an adequate supply of crude oil to make the maximum amounts of those products with the available facilities. With the increasing number and size of such war plants, the problem of obtaining ever larger volumes of crude becomes geometrically more difficult. The fact, however, that due to the educational program of the past 2½ years, the authorities controlling the essential and critical materials are more cognizant of the true situation and importance of the production branch of the oil industry, insures adequate assistance in gaining PAW's objectives.

Tied in intimately with the production division, and now actually a part of it, was the reserves division, responsible for the handling of the effort to find and develop new sources of oil.

Immediately after we entered the war there was a drastic shrinkage of oil activities, and by March and April of 1942 consumption, production, refining and drilling rates were low in direct contrast to the large gains in activity that had characterized 1941, due primarily to the disruption of the tanker movement and government regulations curbing the usage of critical materials.

The transportation difficulties, particularly, so severely curtailed production that it was necessary for above-ground stocks to be drawn upon heavily in the Northern and Eastern consumption areas, and while production was shut-in in many of the fields for lack of transportation some 58,267,000 barrels of all oils, or an average of 150,000 barrels daily, was withdrawn from stocks until United States crude stocks were at their lowest in 20 years by the end of 1942.

As more transportation has become available an attempt has been made to meet all the civilian and war demands and at the same time build up the oils in stock. As we go into the new year of 1944 the emphasis now is on productive capacity and exploration. Thus in a period of two years the impact of the war has caused production and exploration to go from a high level to a low level and back up to an all-time peak.

These economic factors, of course, have had their effect on the activities of the reserves division. The reserves of petroleum found each year beginning in 1939 have been substantially less than the oil consumed, and now the industry and the nation are experiencing genuine apprehension as to the ability of the United States to efficiently oil this war, due to falling productive capacity at a time when military demands are increasing.

In the light of this situation, the division has developed definite programs to aid in the finding of new reserves for use during and immediately after the war.

The Geological Survey has been given an emergency appropriation for the purpose of developing and making available fundamental geological information for the purpose of attracting additional capital into the search for new reserves, both in continental United States and in Alaska, where it is hoped to find new reserves along the air routes to Russia and near our military and naval bases in the Aleutian Islands, and PAW itself is hard at work on a program to (a) assist in making critical materials available to manufacturers of precision instruments used in the exploration, development, production, refining and marketing branches of the industry; (b) assist in securing necessary labor and technical skill as replacements for those taken into the armed forces as well as assist in obtaining consideration by Selective Service in deferring technically trained and skilled personnel, and (c) assist in the programming of various production schedules within the War Production Board.

Because oil is becoming harder to find, the reserves division has devoted considerable time and energy to questions of conservation, and has encouraged the development of new techniques for secondary recovery, such as horizontal drilling in Western Pennsylvania, in water flooding, unit development, the saving of natural gas and its utilization as a source of materials required for the oil program, particularly 100-octane gasoline. •

DONALD R. KNOWLTON
Director, Production Division

Received A.B. in geology at University of Colorado, 1920, E.M. in petroleum engineering, Leland Stanford University, 1924; joined Phillips Petroleum Company as petroleum engineer, 1926; left as production manager, 1941, to become assistant director of production, OPC; appointed director of production, February, 1942; is national chairman, American Petroleum Institute special study committee on well-spacing and allocation of production; affiliated with API, AIMME, Oklahoma Stripper Well Association, Independent Petroleum Association; author of many engineering and conservation articles.

RALPH J. SCHILTHUIS
Assistant Director, Production Division

Born in Denver; graduated from Colorado School of Mines with degree of petroleum engineer; received Harrison Award for meritorious work in petroleum engineering; joined Humble Oil & Refining Company as engineer in research department, 1930, becoming successively assistant director of production research, engineer, administrative department, and supervisory petroleum engineer, production department; joined PAW in 1941; received Alfred Nobel Prize in 1939 for paper on "Connate Water in Oil and Gas Fields"; author and co-author of numerous technical papers on oil- and gas-field development and production.

J. ED HESTON
Assistant Director, Production Division

Born in Stillwater, Oklahoma; roustabouted and scouted during college vacations; joined Empire Oil & Refining Company, 1934; petroleum engineer and geologist, Cities Serice Company, New York, 1935-36, and division production engineer in West Texas-New Mexico Division, 1936-38; petroleum engineer and geologist, Petroleum Advisers Inc., New York, 1938-41; joined WPB in August, 1941, later joining PAW.

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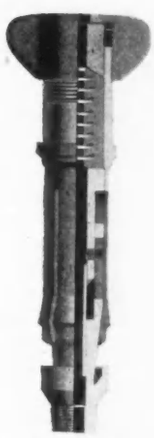

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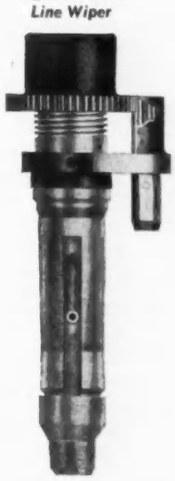

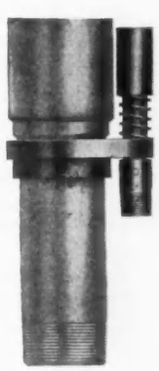

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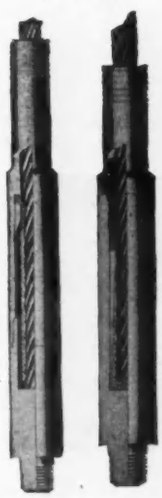

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Although the reserve division has been consolidated into the production division, the functions it formerly performed will be closely coordinated in the new set-up, with the realization that more new oil can be found only if we are successful in our future exploratory drilling.

Transportation Division

EVERY division in PAW, of course, has had its moments of crisis, but the transportation division for more than two years was just one crisis after another, and its story is the most dramatic of all.

The immediate problem confronting the division at the outset of the war was that of replacing tanker deliveries to the East Coast. Its activities in building up a pipe-line empire to that end have received much attention by the press and public, but it had other problems and was faced with the necessity not of just building up oil movement to the East Coast but of developing world transportation.

Even before Pearl Harbor, the submarine warfare which resulted in extensive tanker sinkings necessitated the initiation of convoy operations in many parts of the world and the slower convoy movement required additional tankers to accomplish the same deliveries. It was this factor that made imperative the development of expanded and faster transportation to the East Coast, so that the fewer available tankers could deliver oil to the war fronts on the shorter haul.

With tankers being diverted in large numbers from East Coast to war service, division officials foresaw the possibility of the East being practically cut off from oil supplies (only 118,000 barrels daily was received in District 1 by overland transportation in 1941) if quick and effective action was not taken.

The first step was to harness the rail movement, which then amounted to about 5000 barrels daily, and in the 13 months from June, 1941, to July, 1942, tank-car deliveries rose to more than 800,000 barrels a day, and a year later, when the Big-Inch pipe line began operating to Norris City, hit a peak of more than 1,000,000 barrels. Currently, rail deliveries to the seaboard area are less—about 750,000 barrels daily—as the completion of Big-Inch to the Philadelphia-New York area permitted the release of cars for service in other areas.

With an increase in the rail movement under way, the division devoted its attention to the development of pipe lines, hoping that they could be brought into operation before the steadily mounting war traffic created a rail congestion which might interrupt deliveries.

Fortunately for the East Coast and the war program itself, no serious rail traffic crises arose while the 11,000 miles of constructions, reversals and conversions of pipe lines was under way.

Handicapped by the inability of officials in other agencies which controlled the distribution of the needed materials to see the necessity for big-scale pipeline construction, the PAW program was long delayed and its cost increased.

It took more than a year to reverse the attitude of those agencies, but once the way was cleared PAW and the industry swung into high on a $260,000,000 program which included construction of Big-Inch, the world's largest crude line; Little-Big-Inch and a number of lesser lines, and the conversion and reversal of other lines in strategic locations. These projects—19 in number—are now rapidly being completed, and by next spring pipe-line deliveries to the East Coast will amount to 60 percent of the pre-war tanker deliveries to that area from domestic sources.

While pipe lines thus become the backbone of the wartime transportation system, other methods of moving oil also were expanded to the greatest extent possible. The barge movement over the inland waterways has been increased from some 64,000 barrels daily

GEORGE A. WILSON
Director, Transportation Division

During years 1933-1940, maintained private law practice in New Orleans as specialist and consultant on oil and gas, and during this period served as part-time professor of oil and gas law at Tulane University Law School; general counsel, Louisiana Conservation Commission and Department of Minerals, 1940; joined Standard Oil Company of Louisiana as head of production, pipe-line and crude-oil-law department, July, 1941; was director of Mid-Continent Oil & Gas Association; appointed executive officer, PAW transportation division, April, 1942; succeeded J. R. Parten as director of division, November, 1943.

JUBAL R. PARTEN
Former Director of Transportation

Joined PAW in August, 1941, as member of tanker coordinating board; succeeded Henry A. Gilbert as director of transportation on April 2, 1943; resigned November 24, 1943, to return to his industry positions of president of Woodley Petroleum Company and chairman of board of Premier Oil Refining Company. Active in Independent Petroleum Association of America, American Petroleum Institute and Mid-Continent Oil & Gas Association; member, and for two years chairman, board of regents of University of Texas 1935-41; served in World War I as captain and major, field artillery.

HENRY A. GILBERT
Former Director of Transportation

Organizer and president, Oil Transfer Corporation, New York; member, American Petroleum Institute and its central committee on tanker and barge transportation; member, Society of Naval Architects and Marine Engineers; director, New York State Waterways Association, Inc., and Maritime Exchange of Port of New York.

BRUCE C. CLARDY
Assistant Director Transportation

First job, 1916, as civil engineer chairman for McMann Oil & Gas Company; held variety of jobs including bookkeeper, roustabout, pumper, superintendent and general manager for The Jackson Company and Evans Oil Company, San Antonio, 1920-27; chief deputy supervisor, oil and gas division, Texas Railroad Commission, in 1927; proration umpire, Yates field, 1928-29; manager, crude oil department, Shell Oil Company, Dallas and Houston, 1929-36; president of Heyser, Heard & Clardy, Dallas, drilling contractors and producers, April 15, 1936; joined PAW, 1942.

WALTER R. LANGE
Assistant Director of Transportation

Born in New York, entered petroleum industry in February, 1914, engaging in petroleum transportation, particularly by ocean tankers and inland waterways, with Standard Shipping Company, Standard Oil Company of New Jersey and Standard-Vacuum Oil Company; in Sumatra for period of time; joined PAW in April, 1942, as executive secretary of the petroleum supply and distribution board and assistant director of transportation.

RALPH P. RUSSELL
Assistant Director, Transportation

Born in Northumberland, Pennsylvania; joined Pennsylvania Railroad, 1902, leaving post as car service superintendent, September, 1941, to become chief of Tank Car Section, Office of Petroleum Coordinator; assistant Deputy Solid Fuels Coordinator, December, 1941; special consultant, PAW Transportation Division, March, 1942; appointed assistant director of transportation, September, 1943.

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in April, 1942, to more than 168,000 barrels going to the Eastern area, with relative increases in movement in other areas; during September, 1943, it is estimated total port-to-port and within-port movements on the seven principal sections of the inland waterways in the Eastern United States amounted to approximately 40,000,000 barrels, and the inland waterway fleet also plays an important part in increasing East Coast supplies through the integration of barge movements on the Gulf Intracoastal Waterway and the Mississippi River System with connecting tank-car and pipe-line facilities. Lake-tanker and tank-truck facilities also were fields in which the division operated.

With completion of the present construction program it is believed we will have realized a balance between available facilities and supply requirements on a nation-wide basis with due allowance for shifts of mobile facilities from one area to another as military requirements determine.

While no allowance was made for Gulf to East Coast north of Hatteras tanker deliveries in this program because of the many uncertainties of war demands upon tankers, nevertheless, this new transportation pattern will permit the best use possible of tankers when and as available because a shift of mobile transportation can be made to meet the nation's needs in all areas.

Foreign Division

THE foreign division is PAW's strategic service, its activities closely linked with those of the military. Nothing is available as to what the division has done, is doing or will do.

The functions of the foreign division are to plan and coordinate foreign petroleum operations so as to assure supplies adequate for the armed forces, industry and civilians abroad, and to regulate the material requirements of foreign oil operations.

With the whole world as its field, the division has been involved in such projects as the procurement by American companies of equipment for expansion of operations in South America and the furnishing of equipment for increased production and refining in Allied and neutral countries.

Since PAW has neither authority, funds nor machinery for direct expansion of operations abroad, the foreign division has concerned itself solely with the problems arising in existing operations in foreign countries, unlike the Petroleum Reserves Corporation, whose charter provides for direct participation in commercial activities.

WILLIAM B. HEROY
Director, Foreign Production Division

Born New York City; served United States Geological Survey, 1907-19; temporarily detailed as petroleum adviser to Department of Justice, 1913; joined Sinclair Consolidated Oil Corporation, 1919; became vice president and later president of Pilgrim Exploration Company, Houston, 1938; member of API committee on petroleum reserves from date of its inception to 1938; past president of American Association of Petroleum Geologists; appointed director of PAW reserves division, July 1942; director of foreign production division, November, 1943.

WILLIAM DeWITT CRAMPTON
Director, Foreign Supply and Distribution Division

Born in Naugatuck, Conn., December 7, 1890; entered National City Bank, New York, 1915, and transferred to London office, 1916; joined U. S. Headquarters, London, September, 1917, and commissioned Captain, QMC Reserve, February, 1918; promoted to Major, February, 1919, and demobilized, April, 1919; joined Bedford Petroleum Company, S.A.F., Paris, 1919; subsequently manager, director and vice president and managing director; director and managing director of Associated Jersey companies in France; European coordinator of lubricating oils for European and North African companies; returned to United States, February 1941; joined OPC foreign division August, 1941, as associate director; became assistant director, February, 1942; named director of foreign supply and distribution division, October, 1943; holder of Legion of Honor and Distinguished Service Order (British).

C. STRIBLING SNODGRASS
Director, Foreign Refining Division

Graduated, United States Naval Academy, 1922; U. S. Submarine School, 1926; resigned commission as Lieutenant, U.S.N., 1928, to join C. F. Braun & Company, Alhambra, California; served as European manager, C. F. Braun & Company, later as director of Nieuwe Octorooi Mij., The Hague, and chairman and managing director of Snodgrass, Perrin & Company, London; after outbreak of war, 1939, acted as technical adviser to independent oil companies with operations in Europe, Burma, South Africa and Trinidad; joined PAW November, 1943.

J. TERRY DUCE
Former Director of Foreign Division

Since 1920 in foreign service of The Texas Company, California Petroleum Company of Venezuela, Columbia Petroleum Company, and California-Arabian Standard Oil Company; is director of American Institute of Mining and Metallurgical Engineers, and from 1930 to 1940 served as chairman of its production section. Was drafted by PAW to organize its foreign division, on basis of 25 years experience in oil business; served as director of foreign division from January 31, 1942, to December 14, 1943, resigning to return to his position as vice president and director of California-Arabian Standard Oil Company.

Supply Division

THE supply division was established in the spring of 1942 for the purpose of helping to solve the severe shortage of petroleum products on the Eastern Seaboard caused by tanker sinkings and to insure that, in spite of this shortage, adequate supplies of products would be made available for naval and military use in that area as well as for transportation overseas for use by our armed forces.

As studies demonstrated that normal civilian consumption and the growing war demands could not both be met, the division developed the data on which OPA was asked first to ration gasoline and then fuel oils, first on the East Coast, later in the Middle West, and still later, as respects gasoline, nationally.

The handling of the East Coast situation was the most publicized but not the only responsibility of the division, which also assists the representatives of the armed forces in arranging definite sources of supply of products and helps to coordinate the activities of their petroleum-procurement agencies with the operations of that part of the industry supplying such requirements; advises the operation divisions of PAW of the steps necessary for the successful execution of the supply program; coordinates the activities and operations of its district offices and coordinates PAW functional activities of supply with other governmental agencies; enlists the aid and cooperation of the industry in the execution of the supply program and the solution of emergency supply problems, and is responsible for the successful accomplishment of the objectives of PAW orders and directives relating to supply.

Its military problems were many, but revolved mainly around the procurement of products of required specifications, such as Navy Special Fuel oil; providing an adequate supply of 80-octane all-purpose gasoline for general use by our armed forces and Allied Nations; securing petroleum products for the British Pool as a part of Lend-Lease, including special grades of burning oils and naphthas.

Any appraisal of the accomplishments of the supply division should be considered in the light of the magnitude of the objectives it was desired to attain.

Considered in this light, the division, with the regular avenues of oil transportation severed, and utilizing entirely new and temporarily inadequate methods, succeeded in providing our armed forces with sufficient quantities of products to fuel a Navy that was doubled

in size in one year, which succeeded in winning its battle with the submarine and which safely transported and convoyed our Army of several millions of soldiers overseas. It provided supplies for our Army to launch its successful campaign in North Africa, the Mediterranean, the Southwest Pacific, the North Pacific, and to prosecute in Europe the greatest bombing raids the war has witnessed.

On top of that, it provided petroleum supplies in this country in sufficient quantities to insure that war plants could continue uninterrupted operations in the greatest program of war or peacetime construction the world has ever seen; provided sufficient supplies of products to enable the continuous and efficient operations of the millions of civilian motor cars, commercial vehicles and public transportation agencies without which smooth functioning of the war effort would be seriously impaired; provided supplies in quantities sufficient to insure that no great suffering or hardships were imposed upon our people because of lack of fuel for home heating and, during a critical period of impaired operation of the transportation system, distributed the limited quantities of products on an equitable basis that produced the most beneficial effects to the war effort and resulted in the least hardship and dislocation to business and civilian activities.

To accomplish this, the division had available three directives (59, 65 and 67) and Petroleum Administrative Order No. 5, actual administration of which, in line with the PAW policy of decentralization of its activities, has largely been delegated to the district offices.

Directive 59 was issued September 25, 1942, and amended December 1, 1943, for the purpose of insuring an equitable distribution of supplies available for the East Coast area, by making shipments to primary suppliers on the basis of current demands, the suppliers assigning proportionate shares to individual suppliers. Shipments to primary suppliers are allocated in proportion to their adjusted 1941 sales in each area or zone, the allocations being adjusted to meet the varying impacts of the war upon different suppliers and their customers, since many of the fluctuations in demand are war-imposed and beyond the control of the supplier.

Directive 65 was issued March 17, 1943, for the purpose of making efficient use of all available transportation facilities in the 15 Middle Western states and to release mobile transportation equipment for service to the East Coast; it was designed to insure efficient movements of petroleum products and eliminate inefficient movements by reducing the distance any product is transported (eliminating most movements in a generally southerly and westerly direction and substituting movements in a generally northern and easterly direction), eliminating backhauling and cross-hauling and substituting pipe-line movements for tank car, truck, barge or lake tanker movements.

Directive 67 was issued May 22, 1943, for the purpose of accomplishing similar objectives to Directive 65 in Texas, Louisiana, New Mexico, Arkansas, Mississippi and Alabama.

Petroleum Administrative Order No. 5, issued January 21, 1943, and amended September 24, helps to supplement Directive 59 in accomplishing an equitable and efficient distribution of products on the East Coast. Most of the products shipped to this area are strictly scheduled and allocated under the provisions of Directive 59, and additional shipments can be made only by securing an exception to PAO No. 5, and this control permits a more effective coordination so that products can be directed to the points where they are most needed in accordance with the supply program.

ROBERT LEE MINCKLER
Former Director of Petroleum Supply

With General Petroleum Corporation of California, becoming assistant to president in 1934; director, Kettleman North Dome Association; past president, Petroleum Accountants Society; served as vice chairman of industry transportation committee for District 5; served as director of petroleum supply for PAW from March 10, 1942, until May 15, 1943.

RICHARD C. SAUER
Assistant Director, Division of Petroleum Supply

Born in Cleveland, Ohio; joined Standard Oil Company (Ohio), December, 1922, and remained with that company until loaned to PAW in March, 1942.

LUCIEN F. CRAIG
Assistant Director, Division of Petroleum Supply

Born in Oklahoma City; joined Kansas City Board of Trade, 1914; with Empire Gas & Fuel Oil Company, Bartlesville, 1916-21; certified public accounting, specializing in petroleum industry, 1921-23; joined Independent Oil & Gas Company, Tulsa, 1923, as assistant secretary and treasurer, later becoming assistant to vice president in charge of marketing; with Phillips Petroleum Company, 1930-35; joined Gulf Oil Corporation, Pittsburgh, in 1935; appointed assistant director, PAW petroleum supply division, March, 1943; served in Washington during NRA period as secretary of the board of review of the Planning and Coordination Committee and as assistant to the National Coordinator for Refining.

Program Division

THE program division is one of PAW's newest units, born of the pressure of war demands and the rapid changes in emphasis and relative importance of war problems. It was organized in July, 1943, and is, in effect, a clearing house which reveals how the various branches and segments of the industry, as well as the various geographic areas, will balance out under any given set of conditions.

Monthly the production and natural-gasoline divisions supply information on proposed raw material production rates; the marketing divisions and the

LOUNSBURY S. FISH
Director, Organizational Planning

With Standard Oil Company of California for more than 20 years, devoting efforts to organizational work; given leave of absence to undertake organizational planning of WPB; came to PAW for same purpose on March 18, 1943; advises and assists administrator and deputy administrator in developing and maintaining a plan of organization through which PAW activities can be directed, coordinated and controlled.

E. J. SKIDMORE
Director, Administrative Division

In Philippine service, 1910-17; personnel officer, United States Shipping Board, 1918-33; office manager, Tennessee Valley Authority, 1933; manager, Civilian Conservation Corps Division, Interior Department, 1934-36; associate administrative officer, Indian Service, Interior Department, 1936-42; director, PAW Administrative Division since 1942.

military services report on the demands for the various refined products; the refining division supplies data on available refining capacity, both total and by particular products; the transportation division advises on transportation availability, both for raw material to refineries and for "clean" and "dirty" products from refineries to point of demand; the supply division furnishes details on near term scheduled movements of military and other products, and the foreign division supplies similar information on foreign supply, transportation and demand for both raw materials and refined products.

The program division then fits all the data into a composite picture, a program which must utilize all the refining capacity, all the raw material and all the transportation available to the maximum efficient possible to meet demand at the points where that demand exists. Before adoption, the program is subject to review and modification by PAW and industry committees and, when approved, becomes the official schedule and policy of PAW for the month for which it is prepared.

On the same basis, the division also prepares long-term forecasts, which highlight the problems that are likely to be encountered, thus affording an opportunity to plan for new construction and alterations that will be required.

The growing importance of the overall world-wide military petroleum demand and the necessity of limiting civilian requirements to meet these enormous demands present many complexities to the policy-making operating units of PAW, making the service rendered by the program division increasingly essential. In this phase of its work, the division maintains a close liaison with its British counterpart, and together a world-wide program is worked out in conjunction with the military and shipping authorities.

As this liaison and coordination work more smoothly with practice and experience, it is anticipated that the United Nations will have available at all times a service through which the world petroleum picture can be constantly analyzed and anticipated with a reasonable measure of accuracy.

E. D. CUMMING
Director of Refining Division

Employed by Shell Oil Company in Pacific Coast refining operations; managed Wood River, Illinois refinery; transferred to New York as vice president in charge of refining; joined PAW as director of refining, December, 1942, succeeding Wright W. Gary.

WRIGHT W. GARY
Former Director of Refining

Entered oil business with Continental Mexican Petroleum Company; later acted as refining consultant, perfecting several refining processes and in charge of construction of a number of plants; joined M. W. Kellogg Company, New York, as director of research and development, 1929; became assistant to vice president, 1935; joined PAW June 23, 1941, as director of refining; credited with much of success of industry's aviation-gasoline program and other refining activities; resigned August 1, 1942, to become president, Filtrol Corporation, Los Angeles.

ROBERT BARRETT CRAGIN
Assistant Director, Refining Division

Born in Chicago; joined M. W. Kellogg Company, Jersey City, 1934, assistant director, petroleum research laboratory, 1937-38, acting director, 1938-39; sales and contact engineer, process engineering in petroleum refining, 1939-41; joined PAW as assistant director of refining in July, 1941.

W. R. ARGYLE
Assistant Director, Refining Division

Born in Spanish Fork, Utah; joined Bureau of Mines, Pittsburgh, 1918; engineer in charge of fuel, Sinclair Refining Company, Chicago, 1920-24, sunperintendent of Marcus Hook refinery, 1924-43, assistant manager of refineries, 1943; joined PAW in September, 1943, as assistant director, refining division.

Refining Division

PROBABLY the most important contribution of the oil industry to the war effort has been the meeting of constantly increasing demands for aviation fuels, both as to quantity and quality.

Even before the United States was threatened with war, efforts were made to forecast probable requirements for 100-octane gasoline, and to interest government in financing plant expansion and stock pile aviation gasoline against emergency.

In June, 1940, production capacity for aviation fuel was somewhat greater than current demand, and estimated daily requirements for probable war demand were placed at about twice the production capacity. An accumulation of gasoline sufficient for some 100 days' requirements was recommended, not only for war emergency but also to maintain refinery operations. Later in 1940, service estimates for the fiscal year 1942 were approximately equal to existing capacity, and these estimates still held in June, 1941, when the Office of Production Management and the services issued a joint release recommending expansion of 100-octane facilities to a daily capacity of 50,000 barrels.

This was the major problem confronting the refining division when it was established shortly after OPC was created, and by November of that year plans had been formulated for meeting estimated increased future requirements by construction of new facilities, with recommendations as to priorities, financing and purchasing of 100-octane fuel. In addition, steps were recommended to secure maximum production of satisfactory aviation fuels from existing facilities.

After our entrance into the war new problems arose, and frequent changes in estimates, construction schedules and fuel specifications were required because of developments in ship construction, synthetic rubber and airplane construction and design. As a result, construction of new facilities has been delayed considerably beyond the original estimated completion dates, and further construction of new facilities has been made necessary.

In the meantime, a program was put into operation to force an expansion of production to meet anticipated demands. Essentially this comprised production of certain additives and blending agents from existing or converted refinery equipment, inter-plant movement of components to effect maximum production irrespective of economic considerations, and technological improvements,

MAX B. MILLER
Director, Construction Division

Construction engineer since 1909; native of Bloomington, Indiana; formed and became president of Max B. Miller Company, New York, 1923; on leave of absence since February, 1942, when he became chief of the construction section of PAW refining division; appointed director of construction division, August, 1943.

GEORGE GIBSON
Assistant Director, Construction Division

Born in Pittsburgh; engaged in technical advertising with George H. Gibson Company, New York, 1924-29; chief process engineer and sales engineer for C. H. Leach Company, manufacturers of specialized heat-exchange equipment for oil refineries, 1929-40; engaged in design and construction of thermal-cracking unit for Hancock Oil Company, Long Beach, California, 1941; joined PAW in 1941; named assistant director of construction division, September, 1943.

M. BROOKS FITZGERALD
Assistant Director, Construction Division

Born in Glen Ridge, New Jersey; joined Standard Oil Company of New Jersey for vacation work while attending high school and college, upon graduation becoming statistical research assistant, and later assistant fuel oil burner manager; joined PAW in March, 1942, handling allocations on 100-octane, toluene, aviation lubricant and butadiene conversion programs; appointed assistant director of construction in August, 1943.

the last named resulting from an early realization that new processes must be looked to for the bulk of estimated gasoline requirements.

Through recommendations providing for full exchange between all persons and companies concerned of required information on new processes which then were still in the laboratory or pilot plant stages, and by various committees set up in the industry, much of the uncertainty of their possibilities was eliminated and important increases in productivity brought about. Among these new developments may be mentioned new blending processes, new and better test methods, the discovery of sources of additional feed stocks, and modifications of processing methods and operating conditions.

Along with this problem for provision of 100-octane aviation fuel—a problem which was never static, as the armed forces repeatedly increased their estimates of requirements — there were others of lesser magnitude but considerable importance. The oil industry is the producer of most lubricating oils and greases, many of which require additive and compounding materials to modify the physical and chemical properties of the mineral oil base; specialized lubricants had to be developed to meet the specifications of the services for operations extending from the Tropics to the Arctic regions. Arrangements for the production and supply of necessary additives and compounding materials in the required quantities, both within the industry and elsewhere, were made in close cooperation with other government agencies and private organizations.

Toluene and other raw materials from petroleum sources were produced in large quantities through similar cooperation to meet the needs of the war machine. Pending completion of butadiene facilities in the synthetic rubber program, arrangements were made with the industry for its production by processes adaptable to existing equipment with a minimum of alteration.

The construction of new facilities determined to be necessary for the war program differs from the typical wartime program in certain significant respects. Out of over 100 projects, but 2 have involved the erection of complete refineries; the remainder have consisted, essentially, in obtaining and erecting special equipment in conjunction with privately-owner continuously-operated refineries. This program is characterized by a relatively high proportionate dollar value of hard-to-get specialized pumps, motors, alloys, instruments, etc., with a relatively small proportion of the cost expended on non-critical materials and unskilled labor. In many ways, the material requirements for a 100-octane plant are remarkably similar in character to those required for a naval vessel.

Today, substantially the entire industry is mobilized to supply the aviation fuel, motor gasoline, lubricants, toluene and synthetic rubber raw material required for our military operations, as well as these and other products needed for war and essential civilian operations.

The refining division's job was primarily one of construction and, in fact, the present construction division originally was one of its section, its task being to expedite the building of the new facilities.

As might be expected from the character of construction, these additions to existing refineries have for the most part been privately financed, less than one fourth of the total costs representing government investment in refining equipment.

But while the expansion of aviation gasoline output was handled by the industry itself in cooperation with PAW, the development of the synthetic rubber program made it necessary for the construction division to develop a close working arrangement with the Office of Rubber Director to the end that plants for producing butadiene and other petroleum raw materials would be accorded priority ratings similar to those given units in the rubber program itself. The division has been involved in substantially continuous negotiations with WPB and the proponents of other "must" programs to get the parts to the jobs as soon as possible and in accordance with production schedules. More recently, labor shortages and labor morale have become significant factors in retarding completion of new facilities, and the division is devoting considerable time to the solution of these problems.

The new refining and transportation facilities and technological advances, unlike much of the wartime developments in other fields, will be of considerable value after the war. Motor and aviation fuel, lubricants and other basic petroleum products, of course, will be required in tremendous amounts during the reconstruction period and thereafter. In addition, large quantities of technically pure compounds will be available for industrial purposes as a result of the accelerated conversion of the petroleum industry into what may be more aptly described as a chemical industry. Thus, the investment of time and material which has been made by private organizations and the government will continue to yield large dividends for a long time to come.

EDWARD B. SWANSON
Director, Research Division

Graduated University of Washington, 1918; graduate work, Brookings School of Economics and Government; entered Bureau of Mines, 1920; employed by Argentine government as economist, 1924-25; rejoined Bureau of Mines, 1925, serving as assistant director, petroleum economics division, 1926-28, and chief economist, 1928-34; appointed associate director of production, Petroleum Conservation Division, 1936; served also as chairman of Voluntary Committee on Petroleum Economics for Federal Oil Conservation Board, 1931-32; appointed member, Petroleum Administrative Board, in charge of production and refining, 1933; appointed director of research diision, PAW, August 1, 1941.

FREDERICK H. HARBISON
Labor Counselor

Graduate of Princeton University and member of staff, 1938-40; on leave from economics department, University of Chicago; served as labor consultant to iron and steel branch of Office of Production Management, 1941-42; manpower consultant for automotive branch of War Production Board, 1942; chief of labor supply section, civilian personnel division, Service of Supply, War Department, 1942-43; appointed labor counselor to PAW, March, 1943.

ALLEN A. JERGINS
Director, Facility Security Division

Geologist and engineer with 17 years' experience in oil industry; vice president, Jergins Oil Company, Long Beach; was vice chairman, California Oil Industry Protection Committee and member, Western Region Committee of PIWC Committee on Protection of Petroleum Facilities.

WILLIAM D. MASON
Former Director of Facility Security Division

Seventeen years in oil industry; started with Jergins Oil Company, Long Beach, California; was vice president of San Joaquin Valley Oil Producers Association; vice chairman, Oil Industry Protection Committee of California; member of western region committee, PIWC committee on protection of petroleum facilities. Served on leave of absence from Sun Oil Company as director of facility security division from April, 1942, until May, 1943; is vice president and director of Jergins Oil Company, president of Monterey Exploration Company, and vice president and director of Lomita Gasoline Company.

Manpower Division

AT THE outbreak of the war the oil industry had no manpower problems and it was not until the beginning of 1943 that a serious situation began to make itself felt, the result of raids by other war industries on the skilled ranks of the oil workers and the calling of men for military service.

Recognizing that the industry could

not fulfill its responsibilities unless it had adequate labor supplies, PAW set up a labor counselor, who at once pressed for general adoption of the 48-hour week throughout the industry, which was still on a 40-hour basis in most instances, and began to work out with the Selective Service a more orderly program for effecting withdrawals of industry personnel for military service.

The maintenance of forces in the production branch was of vital importance, and the labor counselor has developed a program for the return of some skilled field men from the war industries to which they shifted in 1941 and 1942, to recruit additional workers through the War Manpower Commission, and to stabilize wage rates uniformly throughout the Mid-Continent area and assure continuity of employment. At the present time about 22,000 workers are engaged in drilling operations, and an additional 10,000 will be needed to meet the requirements of the expanded drilling program for 1944.

Similarly, a program has been worked out to grant deferments to technical and key personnel engaged in exploration, a priority placing aviation gasoline construction on a par with the other top priority programs has been secured to aid in getting construction workers for the new plants, and a refinery staffing plan, calling for strict control, has been initiated to aid in getting the 10,000 additional workers which will be required to man the new aviation-gasoline facilities now coming on stream.

E. HOLLY POE
Former Director of Natural-Gas and Natural-Gasoline Division

Joined Tidal Oil Company (now Tidewater Associated Oil Company) 1918; with Tiger Mountain Oil Company and its subsidiary, Henryetta Gas Company, Tulsa, 1920-27; Central States Power & Light Company, 1927-37; secretary, Natural Gas Section, American Gas Association since 1937; served as director of PAW's natural-gas and natural-gasoline division from June 1, 1942 to October 13, 1943, when appointed to Petroleum Reserves Corporation.

PAUL M. RAIGORODSKY
Former Assistant Director of Natural-Gas and Natural-Gasoline Division

Native of Russia and served that country in World War I as lieutenant of cavalry; came to United States in 1921; student at Kiev Polytechnic Institute, Polytechnic Institute in Prague, Czechoslovakia, and University of Texas; since 1924 has had extensive and varied experience in oil and gas industries; is vice president and general manager, Petroleum Engineering, Inc., and Glen Rose Gasoline Company; joined PAW in September, 1941, served as assistant director of natural-gas and natural-gasoline division from June 1, 1942 to July 12, 1943.

Natural Gas and Natural-Gasoline Division

THE natural gas and natural-gasoline division is divided into three sections dealing, respectively, with natural gas, natural gasoline and liquefied petroleum gases.

The natural-gas section has planned development programs, by districts, necessary for the maintenance of adequate supplies to domestic, commercial and industrial consumers, it being estimated that 25 percent of the latter's natural-gas consumption is now devoted to essential wartime production.

Among the activities of the section were its participation in arranging the release of the Stan-Pac gas line from Kettleman Hills to the San Francisco Bay area for the transportation of oil, the release of a gas line from Refugio to Houston, Texas, for oil transmission, its recommendation for use of the depleted Playa del Rey field in California as a storage reservoir, conserving and making available two billion cubic feet of gas per winter season for the Los Angeles area, and the stimulation of use of storage in the Appalachian area.

With the production division, the gas section established programs for the conservation of gas in oil production, which reduced gas wastage in California by two thirds and returned 100 percent more gas to producing formations for repressuring. The section also aided producers in the standardization of well casing and tubing, and in establishing programs for conservation and salvage of critical materials, participated in the diversion of critical materials to transmission facilities badly needed by industrial areas, and supervised all gas-field development to save critical material and permit its diversion to other vital needs.

The natural-gasoline section's activities have been closely linked to the aviation-gasoline and synthetic rubber programs, for which natural gasoline and allied light hydrocarbons are base stock and important raw materials.

In order to utilize the increasing condensate reserves of the Southwest to the utmost degree, the section prepared and obtained from WPB a Program Determination for the issuance of the necessary preference ratings and material allocations for the construction of sufficient natural-gasoline and cycling plants to produce approximately 35,000 barrels daily of natural gasoline and allied products.

This section also formulates programs for the production of those constitutents, when and where needed, of fundamental importance in the aviation gasoline, synthetic rubber, and explosives programs, thereby assuring a continuous flow to war plants.

It also has aided in the development of condensate fields, assuring maximum recovery and longevity of reserves, and, through the Bureau of Mines, has initiated a program for geological and physical studies of the important condensate fields throughout the country so that data would be available for determining potential locations for cycling plants to furnish raw materials for high-octane aviation gasoline production, and has secured the bureau's cooperation in research relating to the thermodynamics of butane and butadiene for use in the synthetic-rubber program.

The activities of the liquefied petroleum gas section has been devoted largely to diverting over 95 percent of additional supplies of such gas to users

JAMES E. PEW
Director, Natural Gas and Natural Gasoline Division

Born in Pennsylvania; connected with natural gasoline industry; superintendent in charge of production, construction, design and maintenance of natural gasoline plants for Virginian Gasoline & Oil Company, Charleston, W. V., when appointed assistant chief, natural gas and natural gasoline section, January, 1942; appointed director of division, October, 1943.

ROBERT W. DUCKER
Assistant Director, Natural Gas and Natural Gasoline Division

Born in Devils Lake, North Dakota; connected with gas and pipe line companies, including Crusader Pipe Line Company, El Dorado, Arkansas, and CIA Transcontinental de Petroleo, Tampico, Mexico, 1924-29; chief engineer, Standard Oil Company of Venezuela, 1929-31; chief engineer and general superintendent, Oklahoma Natural Gas Company, Tulsa, 1931-42; joined PAW April 1, 1942, as chief of the natural gas section, appointed assistant director of division, October, 1943.

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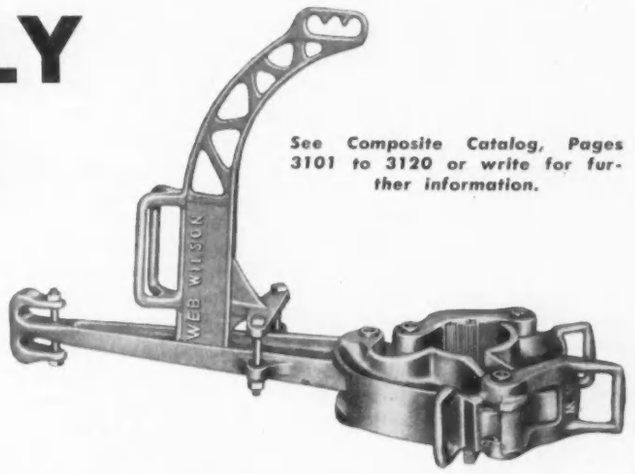

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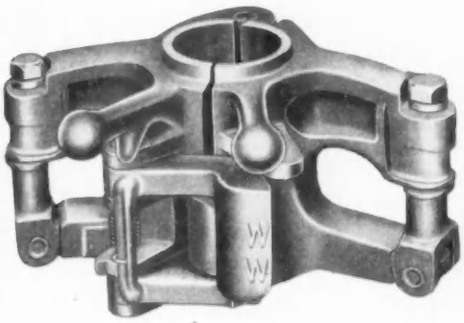

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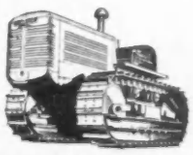

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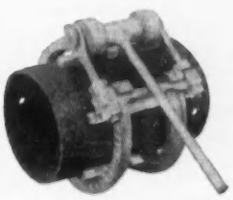

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directly or indirectly connected with the war. Some 90 percent of the additional consumption is going directly into wartime production use, while the balance is devoted to Army camps, hospitals, agricultural use, defense housing and migration brought about by the war.

Specific industrial uses for liquefied petroleum gas include annealing, normalizing, drawing, carburizing, hardening, forging, space heating, metal cutting, die casting, galvanizing, paint drying, core-baking, vitreous enameling, and airplane-engine testing, and it is also replacing gasoline and motor fuel required by the armed forces in the operation of internal combustion engines.

WALTER HOCHULI
Director, Marketing Division

Born Schenectady, New York; joined The Texas Company, 1924, as salesman; resigned as assistant district manager, 1931, to join Indian Refining Company, Indianapolis, becoming sales-manager; returned The Texas Company, 1934, as assistant territorial manager, becoming vice president, Indian Refining Company, 1937, and territorial manager in Chicago, The Texas Company, 1938; joined PAW as director of Marketing, March, 1943.

ROGER M. WILKINSON
Assistant Director, Marketing Division

Born in Somerville, Massachusetts; joined Socony-Vacuum Oil Company in 1923, transferring to the marketing department after one year in the tanker service, being marketing assistant for automotive products in the New England area when appointed PAW assistant director of marketing in August, 1943; served as chairman of the New York State Petroleum Industries Commitee, 1939, and chairman of similar committee for Massachusetts, 1942-43.

ROBERT T. COLLIER
Former Director of Marketing

Employed by General Petroleum Corporation as geologist, he progressed into the land department, crude-oil purchasing, refining operations, and finally into marketing, where he became division manager of sales; vice president of Van Fleet Durkee, Inc., West Coast service station operators, 1929-31; division manager, Shell Oil Company, 1931-40; vice president, Great Lakes Carbon Corporation, 1940; succeeded John W. Frey, when later appointed assistant deputy administrator, as PAW's director of marketing, serving from July 9, 1942 to April 15, 1943; when resigned to return to private business.

Marketing Division

THE marketing division has jurisdiction over probably the widest segment of the operations in which PAW is involved, the consumer field.

The division is charged with the responsibility of planning and adjusting industry marketing practices to meet changed conditions of supply and demand incident to the war, and to so direct marketing activities of the industry as to best serve military and essential civilian needs.

Shortages of supply and rationing of what is available have made it difficult for filling station operators to continue in business, and to insure the maintenance of adequate station facilities the marketing division has regulated the hours of business and the credit practices of retailers, demanded an equitable distribution of supplies and fixed jobber and dealer margins.

In the field of fuel oil it has handled the conversion programs designed to shift part of the fuel load from oil to coal, necessarily abandoned when the coal situation became equally critical, and has regulated the distribution of fuel oil in the ration area.

The division also has concerned itself with the distribution of marketing equipment and supplies so as to keep existing facilities operating, has dealt with the problem of containers for vital products, the allocation of micro-crystalline wax, the use of asphalt and tar products, and the joint use of facilities.

District 1

DISTRICT headquarters are maintained at 1104 Chanin Building, 122 East 42nd Street, New York, N. Y.

The area covered by this district is the Atlantic Seaboard or East Coast, consisting of the following states: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, Delaware, Pennsylvania, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia and Florida.

H. W. DODGE
Director in Charge, District 1

Coming up from the ranks in The Texas Company, where he started in 1904, Dodge has held 26 different jobs ranging from office boy, clerk, bulk-station agent, salesman, general lubrication assistant at Houston, manager of Western territory at Denver, and sales manager of Northern territory at New York; became vice president and general sales manager, 1933; joined WPB in 1941 as special assistant in materials division, later becoming deputy director general for staff; named director of District 1 for PAW on May 6, 1943.

FRANK A. EPPS
Director, Facility Security Division, District 1

Was chief engineer and director of Foamite Fire Extinguishing Company until 1922; then became affiliated with Tide Water Associated Oil Company, serving successively in the following capacities: manager of fire-prevention department, special assignment engineer, chief construction engineer of marketing division, operating manager in marketing division, chairman of profit improvement committee; joined Gulf Oil Corporation as superintendent of operations, New York division, 1935; organized Spartan Oil Company, a petroleum products distributor in Dover, New Jersey, 1940; remained as president of Spartan Oil Company until accepting position of director of facility security division in District 1 of PAW in later part of 1942; is active in various state and national safety and fire-prevention organizations, is director of National Fire Protection Association and has been member of its flammable liquids committee for about 20 years.

FRANK M. BREWESTER
Director, Natural Gas & Natural Gasoline Division, District 1

Has been associated with Hope Natural Gas Company as assistant and district foreman; United States Bureau of Mines, in Wyoming as Petroleum Technologist on drilling and production, in California as assistant deputy supervisor and at Bartlesville Experimental Station as assistant superintendent, and later at Washington as assistant chief petroleum engineer; became general manager of Petroleum Reclamation Company in Bradford, Pennsylvania, 1927; joined Belmont Quadrangle Drilling Corporation, 1928, where he served as general manager and vice president; became president, 1932.

District 2

HEADQUARTERS for this district office are established on the 12th Floor of the Blum Building, 624 S. Michigan Ave., Chicago, Ill.

Under the jurisdiction of the district are the Middle West and Mid-Continent states of: Ohio, Kentucky, Tennessee,

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HOUSTON, TEXAS

CONDENSED STATEMENT OF CONDITION DECEMBER 31, 1943

RESOURCES

Cash in Vault and Due from Other Banks		$21,441,597.13
U. S. Securities	$31,483,000.00	
State and Municipal Securities	282,000.00	
Other Securities	942,300.00	32,707,300.00
($7,079,000.00 Book Value of which are pledged to Secure Deposits of Public Funds and Other Purposes required or permitted by Law)		
Stocks:		
Federal Reserve Bank of Dallas		60,000.00
Other		1.00
Loans and Discounts (Including Overdrafts $328.42)		2,549,193.08
Interest Earned—Not Due		83,198.64
Banking Premises		
Auto Parking Area Vaults, Furniture and Fixtures		370,000.00
Other Real Estate		1.00
		$57,211,290.85

LIABILITIES

Deposits:		
Individual and Corporate (Demand and Time)	$42,378,866.17	
Other Banks, Including Certified and Cashier's Checks	4,676,145.76	
United States	2,503,707.60	
All Other Public Funds	4,932,671.32	$54,491,390.85
Reserved—For Taxes, Interest, Expenses, etc.		169,900.00
Capital Accounts:		
Common Stock	$ 1,000,000.00	
Surplus	1,000,000.00	
Undivided Profits	300,000.00	
Reserved for Contingencies	250,000.00	2,550,000.00
		$57,211,290.85

MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

OFFICERS

Geo. Hamman, President
Winston Carter, Active Vice Pres.
Henry C. Horne, Active Vice Pres.
James Clayton, Vice Pres. and Compt.
F. W. Ilfrey, Vice Pres. and Cashier
E. V. Dreyling, Active Vice Pres.
J. F. Fowler, Ass't Vice Pres.
A. L. Carter, Vice Pres.
C. G. Pillot, Vice Pres.
R. D. Randolph, Vice Pres.
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W. H. Pugh, Ass't Cashier
Wm. N. Sanders, Ass't Cashier
J. E. Sick, Ass't Cashier

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Albert A. Bath	Henry C. Horne
J. P. Bullington	F. W. Ilfrey
A. L. Carter	Robert H. Kelley
W. T. Carter, Jr.	Dr. Fred R. Lummis
Winston Carter	C. G. Pillot
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Michigan, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas and Oklahoma.

W. W. VANDEVEER
Director in Charge, District 2

Independent oil man of Cleveland, Ohio, with 23 years experience in marketing, production, refining, distribution and transportation branches of industry. With F. R. Newman, organized Allied Oil Company, July 15, 1925; concern had following wholly-owned subsidiary — Canton Refining Company; Cleveland Tankers, operating fleet on Great Lakes; Allied Oil Terminals, Inc., with terminals at Cleveland, Toledo and Erie; Central Pipe Lines, Inc., operating crude-oil gathering system in Illinois and Texas; Allied Oil & Burner Company, a furnace-oil distributor. Prior to affiliation with PAW was member of Transportation Committee of District 2; a member of Supply and Distribution Committee for District 2; Chairman of Lake Tanker Subcommitee; and Chairman of Joint Use of Marketing Facilities Committee.

RAYMOND B. KELLY
Director of Production, District 2

Joined Kansas producing division of Empire Gas & Fuel Company as junior engineer; assistant petroleum engineer with United States Bureau of Mines; joined The Pure Oil Company, 1925, served as division engineer at Mexia then transferred to Fort Worth; named assistant division manager, 1932; division manager, Fort Worth, 1935-39; division manager, Olney, Illinois, 1939, to August, 1943; director of production, PAW District 2, Chicago, August, 1943, to date.

EDWARD J. BULLOCK
Director, Facility Security Division, District 2

Began oil career as office boy for P. C. Hanford Company in Milwaukee, 1889, and remained on the staff after the company had been bought by Standard Oil Company (Indiana) in 1891; 13 years later promoted and transferred to Chicago as assistant manager of the lubricating-oil-sales department, of which he became manager in 1906; advanced to manager of Chicago sales division, 1915, and to manager of company's new petroleum products purchasing department, 1919; two years later appointed director of purchases; elected to the board of directors, 1922; in 1927 became vice president in charge of purchasing.

ERNEST L. HUGHES
Director of Marketing, District 2

Entered petroleum marketing field with Oil Marketing Company, Tulsa, January, 1916; became vice president of Western Petroleum Company, Chicago, November, 1916; organized Hughes Oil Company, Chicago, of which he is still president, January, 1921; became associated with PAW as chief of fuel oil section, District 2; later made assistant director of marketing; and then director of marketing.

PAUL J. BOND
Director of Transportation, District 2

Served in last war; transportation experience began with Pennsylvania Railroad, Columbus, Ohio; joined traffic department of Ohio Cities Gas Company, now The Pure Oil Company, 1920; moved to Chicago with that organization, 1926; reported to PAW in Washington as assistant chief of tank car section, transportation division, April 1, 1942; transferred to District 2 Chicago office as director of transportation, August, 1942.

C. H. ALBERDING
Director of Refining, District 2

Started work with Producers and Refiners Corporation, now Sinclair Refining Company, at Parco, Wyoming, working in engineering, laboratory and operating departments; in charge of cracking plant operations for Imperial Refineries of Ardmore, Oklahoma, and El Dorado, Arkansas, 1935; with Universal Oil Products Company since 1927, the first five years on foreign operations and since that time as head of operating department with headquarters in Chicago.

MARK S. PATTON
Director, Natural Gas and Natural Gasoline Division, District 2

Started oil career as tool dresser, 1905; joined marketing division of Cudahy Refining Company; buyer and special representative for Western Petroleum Company; sales manager of Atwood Refining Company; sales manager of Western Oil Corporation; joined Hurley Gasoline Company, which he now owns, 1920; appointed assistant director of natural gas and natural gasoline division, District 2, May, 1942; appointed director of division, September, 1943.

LOYAL B. HOLLAND
Director of Materials, District 2

With Empire Companies, 1918-1922, as junior engineer and assistant construction engineer at Ponca City refinery, and was put in charge of electrical work for Oklahoma, North Texas and Southern Kansas; refinery design engineer, Maryland Refinery Company, 1922-1923; assistant professor of mechanical engineering, University of Oklahoma, and graduate student in petroleum chemistry and petroleum geology, 1923-24; general production superintendent in charge of production, construction and drilling for Case, Pomeroy & Company, Bradford, Pennsylvania, 1924-26; with Phillips Petroleum Company, 1926-35, first as petroleum engineer, then as district production superintendent in charge of Southern Oklahoma and later district production superintendent at Oklahoma City during boom in that field, advanced to division production superintendent in charge of most of Texas; left Phillips in 1935 to go into business for himself; entered government work on December 15, 1941; transferred from Tariff Commission to PAW on April 1, 1942, where he served as director of materials for District 2.

District 3

DISTRICT offices for this territory are at 245 Mellie Esperson Building, Houston, Texas.

States covered are: Alabama, Mississippi, Arkansas, Louisiana, Texas and New Mexico.

WILLIAM M. AVERILL
Director in Charge, District 3

With Gulf Pipe Line Company, 1907-1909; joined Standard Oil Company of Louisiana in 1909; Captain of Field Artillery in foreign service 1917-1919; vice president in charge of transportation facilities, The Pure Oil Company, 1920-1937; president of Amsco Pipe Line Company, 1907; formed partnership of Averill & Cox, 1941; joined PAW, May, 1942, as District 3 director of transportation; resigned June, 1943, to return to own company; called back by the government as director in charge of District 3 in November, 1943.

ADRIAN MOORE
Director of Production, District 3

Entered oil industry with an interest in drilling contracting company, 1917; became division manager for Amerada Petroleum Corporation, covering Texas, Arkansas and Louisiana, 1920; became vice president of Rycade Corporation when that firm organized, 1923; entered oil business for himself as drilling contractor and independent operator, 1930; appointed director of production, District 3, April 21, 1943.

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His weapons? Two willing hands ready to work, sweat and give to make his America live.

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AMERICAN CAST IRON PIPE CO.

BIRMINGHAM ALABAMA

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C. EDWARD NAYLOR
Director of Materials, District 3

Native of Palestine, Texas; started business career with I. & G. N. Railroad, later city passenger agent for Texas & Pacific Railroad at Shreveport and New Orleans, resigned to enter railroad supply business; served as captain of infantry in the first world war; engaged as a manufacturers agent 1919-1924; founded and became president of Maintenance Engineering Corporation in April, 1924; joined PAW, January, 1943.

H. LEYENDECKER
Acting Director of Transportation, District 3

Native of Waco, Texas, entered the oil industry as assistant to the president, Marland Oil Company of Texas in Fort Worth, 1927; joined Tidal Oil Company (now Tide Water Associated Oil Company) as chief scout in 1928; joined PAW in February, 1942, as senior petroleum development analyst in the production division, later made assistant to the director-in-charge and now acting district director of transportation.

DEE P. STURGES
Director of Construction, District 3

Served two years overseas in World War I; employed by Cities Service Oil Company as refinery engineer in Oklahoma, Kansas, New York and other East Coast points; 12 years as superintendent in charge of Braintree, Massachusetts, refinery of Cities Service Oil Company, two years in charge of Cities Service Oil Company's Linden, New Jersey, refinery; joined PAW in 1943.

GORDON T. GRANGER
Director of Refining, District 3

Educated as mechanical engineed at State College of Pennsylvania, entered employ of Tide Water Oil Company at Bayonne, New Jersey, refinery in 1907; in charge of construction of natural gasoline plants for Oklahoma Oil Company (owned by Tide Water Oil Company) at Tulsa, in 1916; same year went with Cosden Oil & Gas Company (now Mid-Continent Petroleum Corporation) in charge of constructing gasoline plants in Cushing field; organized Company D, 111th Engineers, 36th Division, U. S. Army, served as lieutenant with company overseas during first world war; superintendent Sands Springs refinery of Pierce Oil Corporation, 1920; became superintendent Waite Phillips Company's Okmulgee, Oklahoma, refinery, 1924 (later absorbed by Barnsdall Refining Company); constructed refinery at Corpus Christi for Barnsdall Refining Company, 1926; joined PAW, 1941, as District 3 director of refining.

DUDLEY CORNELL
District Council, District 3

Graduated from University of Colorado, 1925, entered private practice in oil, gas and mineral law; 1929 became assistant United States District Attorney at Albuquerque, New Mexico; 1932 returned to private practice; 1942 joined PAW as Director of Marketing, later became District Counsel.

HENRY M. BROWN
Director of Natural Gas and Natural Gasoline, District 3

Entered oil industry with Continental Supply Company in 1923 and became treasurer; resigned to become vice president and treasurer of Missouri Valley Gas Company and subsidiaries in 1929; joined Republic Gas Company and Texas Gulf Producing Company in 1931 as treasurer, became vice president of Republic Gas Company in 1933 and vice president of Texas Gulf Producing Company in 1941; organized and became president of Midland Gasoline Company in 1932; joined PAW in October, 1943, as District 3 director of natural gas and natural gasoline.

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THIS machine is essential in modern drilling — eliminates destructive abrasives from drilling mud; protects and saves critical drilling equipment and materials. Operates entirely from the flow of mud. Three models fulfill any drilling requirements.

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KRAUS EARHART
Director, Facility Security Division, District 3

Entered service with The Texas Company, January, 1919, at Port Arthur refinery, and engaged in various capacities as shop foreman, construction foreman, construction engineer, until 1935; transferred to personnel department to assist in organizing company safety program; joined PAW in November, 1942.

E. J. DORGAN, JR.
Director of Marketing, District 3

Upon graduating from college joined Standard Oil Company of Indiana; 1926 joined Pan-American Petroleum Corporation and became assistant manager at New Orleans; 1928 was transferred to Jackson, Missisippi, and became sales manager in 1932; 1933 returned to New Orleans as assistant manager; joined PAW in January, 1943.

District 4

FROM offices at 320 First National Bank Building, Denver, Colorado, operations of the Rocky Mountains are directed. These states are: Montana, Wyoming, Colorado, Idaho and Utah.

LOUIS G. WILKE
Director of Marketing, District 4

Served as sergeant in artillery with A.E.F. in last war; after getting college degree, coached high school and college athletic teams; joined marketing department of Phillips Petroleum Company, June, 1929, in charge of service station sales promotion; for two years coached famed Phillips "66" basketball team; then district salesman and special representative; assistant division manager at Tulsa, then Wichita, and for last six years assistant division manager of marketing in charge of Colorado; served on various industry committees before joining PAW.

JOHN B. SCHUYLER
Director of Materials, District 4

Joined Oil Well Supply Company, 1912, first job was to learn manufacture of cable tools in Pittsburgh shop; subsequently with Oil Well Supply Company stores at Charleston, West Virginia; Oil City, Pennsylvania, and Casper, Wyoming; joined The National Supply Company in Casper, 1915, and served at various Rocky Mountain oil centers, then to Toledo and from there to Tulsa; with Hillman-Cooney, Inc., in 1921; since which time served in California with Vernon Tool Company, Baash-Ross Tool Company, South

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You and we have a common objective . . . to get the necessary war materials to our boys on the front at the earliest possible moment. Coffing Hoists will help you to speed your handling of war materials. Like our mighty Rangers these hoists are surprisingly fast and will stand attack after attack of brutal punishment in the field or in the maintenance department. In fact wherever a lift or pull is needed there is a Coffing Hoist for that job.

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RATCHET LEVER HOIST

Our new model G series "Safety-Pull" has a new method of control consisting of a side lever for position "up" or "down"; also a neutral position for automatic safety control, making the hoist very simple to operate. A new intermediate locking pawl makes it possible to stop the load in locking position at one-half the length of the regular stroke. Weight 14 to 150 lbs. Capacities ¾ to 15 tons.

QUIK-LIFT
ELECTRIC HOIST

For dependable and economical service the new Coffing "Quik-Lift" incorporates a maximum amount of efficiency with speed, power and durability. Can be plugged into any light circuit and current connection, AC or DC, and uses only a few cents worth of electricity a day. Heavy duty motor, lubri-seal ball bearings, gears and pinions are of special alloy steel, sealed and running in oil, and many other outstanding features. Built in capacities from 250 to 4000 lbs., with load hook or trolley suspension.

MODEL YC SPUR
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Coffing Ball Bearing Spur Geared Chain Hoists are built to live up to the high standards of the Coffing Hoist Company and this new Model "Y-C" is designed and constructed to give a maximum amount of SAFETY, SPEED, DURABILITY and EFFICIENCY.

Mechanically this hoist has no superior. The spur-geared speed reduction, planetary type, is second to none and assures years of trouble-free operation. There are six different capacities: ½, 1, 1½, 2, 3, 4 and 5 tons.

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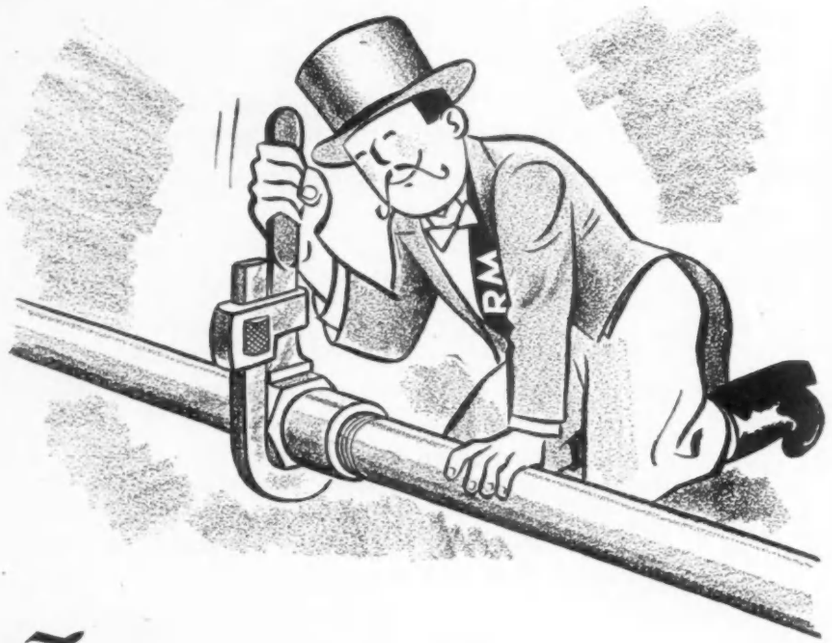

The right connections are vital today —the kind that hold the line against the higher pressures of forced production. There are R/M packings for every type of piping problem, and their performance under all kinds of abnormal, war-time conditions is high tribute to the years of research and development. If you find it difficult to obtain R/M packings for the present, please remember high priorities must be served.

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Chester Tube Company, and American Pipe & Steel Corporation; joined materials division of PAW at Los Angeles in January, 1942; transferred to Denver office as materials specialist, March 1, 1942; promoted to director of materials for District on June 6, 1942.

JOHN R. FANSHAWE, II
Director of Reserves, District 4

Laboratory assistant in geology while graduate student at Princeton; instructor in geology and physics at Deerfield Academy, Deerfield Massachusetts; instructor in geology at Williams College, Williamstown, Massachusetts; geologist with State Royalty Petroleum Company, Camp Crook, South Dakota, 1939; geologist, Ohio Oil Company, 1940, working in Northern Indiana and Southern Michigan; entered into independent consulting practice, Erie, Pennsylvania, 1942; came to PAW on November 16, 1942, as district geologist for District 4, appointed director of reserves for district on November 16, 1943.

District 5

OFFICES are at 855 Subway Terminal Building, 417 South Hill Street, Los Angeles. The district consists of the following states: California, Washington, Oregon, Nevada, Arizona, and also Alaska and Hawaii.

HERBERT R. GALLAGHER
Director in Charge, District 5

Rose through marketing ranks to become head of marketing for Shell Oil Company in California; senior vice president of Shell Oil Company of California from 1911-1932; president of Consolidated Oil Corporation, formed through merger of Sinclair Consolidated Oil Corporation, Prairie Oil & Gas Company and Prairie Pipe Line Company from 1932 until retirement in 1940; appointed director in charge of District 5 in early 1943.

LAWRENCE VANDER LECK
Director of Production, District 5

Went to work for Standard Oil Company of California in its producing department, 1915; joined California State Mining Bureau (now Division of Oil & Gas) in 1916 as deputy supervisor of Division of Oil and Gas; geologist for State Mining Bureau, 1919; became associated with Fullerton Oil Company, 1920; during next 23 years in employ of Fullerton Oil Company, becoming vice president; joined PAW as director of production

THE NATIONAL BANK OF COMMERCE OF HOUSTON

CONDENSED STATEMENT OF CONDITION AT THE CLOSE OF BUSINESS, DECEMBER 31, 1943

RESOURCES

Cash	$ 51,619,843.57	
U. S. Government Securities	70,961,750.00	$122,581,593.57
Other Securities	2,405,795.25	
Federal Reserve Bank Stock	150,000.00	2,555,795.25
Loans and Discounts:		
Time	6,371,766.57	
Demand	3,324,548.92	9,696,315.49
Banking House Equity	3,190,000.00	
Other Real Estate	1.00	
Furniture and Fixtures	1.00	3,190,002.00
Other Assets	51,281.43	
Interest Earned—Not collected	211,469.41	262,750.84
Total Resources		$138,286,457.15

LIABILITIES

Capital Stock		
Common	$ 1,000,000.00	
Preferred	1,000,000.00	$ 2,000,000.00
Surplus		3,000,000.00
Undivided Profits	975,287.16	
Reserved for Dividends	187,500.00	
Reserved for Other Purposes	520,757.75	1,683,544.91
Deposits		
Individuals	105,863,746.80	
Banks	18,046,695.51	
United States	7,301,805.41	
Trusts	390,664.52	131,602,912.24
Total Liabilities, Capital and Surplus		$138,286,457.15

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for District 5. Active in California oil conservation circles for years; charter member of original curtailment committee of California, 1930; for five years (1936-41) was chairman of curtailment body which was then known as Central Committee of California Oil Producers; was president of Oil Producers Agency during 1941, 1942, and part of 1943; was member of PAW Production Committee of District 5 from its inception until he joined PAW.

CHARLES T. REICHERT
Director of Materials, District 5

Worked as roustabout in San Joaquin Valley fields of California; for 2 years employed by Associated Supply Company; in 1917 became connected with The National Supply Company, where he was associated for 16 years in various capacities, including that of engineer in charge of research on absorption plant methods; became general manager of sales for Grant Oil Tool Company of Los Angeles, 1933; following year engaged in general sales activity for Petroleum Equipment Company, specializing in field-store operations; returned to The National Supply Company as sales engineer and manager of the production equipment division, 1935; joined PAW, 1942.

CHARLES B. GARRETSON
Director of Marketing, District 5

Has had 25 years experience with major and independent oil companies; was an officer in United States Navy during World War I; was assistant manager of Pacific Coast Petroleum Agency under NRA; and for the past several years has been executive secretary of the Fair Practices Association, an oil-industry organization; was called to Washington during OPC days before becoming director of marketing for District 5.

KENYON L. REYNOLDS
Director of Natural Gas and Natural Gasoline, District 5

Employed as roustabout and timekeeper by Brea Gasoline Company, 1915; built several gasoline plants in California for this and affiliated companies, 1915-20; built gasoline plant at Breckenridge, Texas, for company in 1920; joined Pacific Gasoline Company, 1921, as vice president and general manager, supervised construction and operation of 28 gasoline plants up to 1926, when Standard Oil Company of California purchased company and he retired from active association with gasoline industry until assumed duties

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Refineries: Cyril, Okla., located on the Frisco Railway
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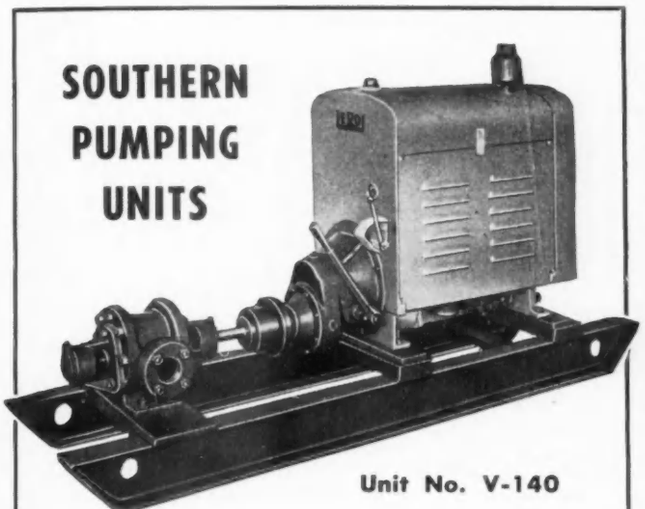
Light Oil products sold through Independent jobbers and distributors throughout the Middle West.

SOUTHERN PUMPING UNITS



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Complete units and replacements in Houston and Kilgore stocks.

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Valves, Flanges, Swages, Fittings *and* Couplings

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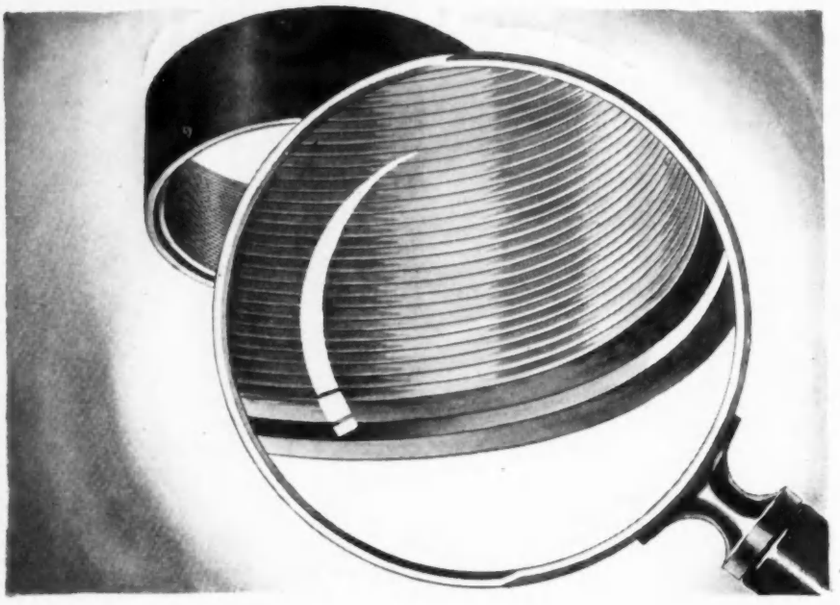

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HARRISBURG
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HARRISBURG ★ **PENNSYLVANIA** ★

of director of natural gas and natural gasoline of District 5 for PAW on March 24, 1942.

MALCOLM P. YOUKER
Director of Refining, District 5

Has developed and patented numerous refining processes, mostly with reference with thermo polymerization; began career in 1910 as construction engineer at Taft, California, for Associated Pipe Line Company; was refinery construction engineer for Standard Oil Company of California; refinery experimental engineer, United States Bureau of Mines; manager of manufacturing for Waite Phillips Company; manager of manufacturing for Barnsdall Refining Company; vice president and general manager of Alamo Refining Company; director and vice president in charge of refining for Phillips Petroleum Company; retired from Phillips Petroleum Company, came to California in June, 1942; assumed duties as director of refining for District 5 in November, 1942.

GEORGE F. PRUSSING
Director, Construction Division, District 5

Worked several years as a plant engineer for Ford Motor Company and Southwestern Shipbuilding & Drydock Company; joined Union Oil Company of California, where he has spent 22 years of general engineering in charge of safety fire prevention and pressure vessel work; served as executive secretary of PIWC Western Regional Committee on Protection of Petroleum Facilities; appointed director of PAW facility security division, District 5, September, 1942; appointed director of construction division, District 5, September, 1943.

EVERETT G. TROSTEL
Director of Reserves, District 5

Joined Union Oil Company, August, 1933, at Los Angeles refinery, where he spent a year in the labor gang and inspection laboratory, and a year in experimental operations of a semi-commercial dewaxing unit; transferred to engineering division of field department, 1935, first employed on core-analysis work and later on measurement and interpretation of subsurface pressures; production engineer at Richfield-Brea-Olinda district; transferred to development engineering work; joined PAW District 5 office when it opened on October 3, 1941, as conservation engineer; made district director of reserves in June, 1943; with recent combining of reserves division and the production division is continuing his same work in latter department.

This Pipe Line's an Acrobat

These days an army travels on its gas tanks. That's why it's so important for mechanized forces to have portable pipe lines with flexible joints...pipe lines that can do acrobatics.

Ordinarily, you know, pipe lines are buried in the ground and are so rigid that going through rugged terrain requires a lot of real engineering.

But there's no time for that on beachheads and at the front. Pipe lines have to be laid fast...and they can't fail, even if they're strung across rivers, ravines, or deep gullies. They must yield to the force of concussion, yet never leak.

Right there is where Victaulic Couplings* equipped with synthetic rubber gaskets come in. They're easily applied. They permit a high degree of leeway in the laying of the pipe lines.

In the invasion of Africa, for example, pipe lines with Victaulic Couplings made it possible for our mechanized forces to be sure of an adequate supply of oil and gasoline while advancing fast and far across rough ground.

As our armies progress, these rubber elbows in the steel arms that carry essential fuel will play an increasingly important part.

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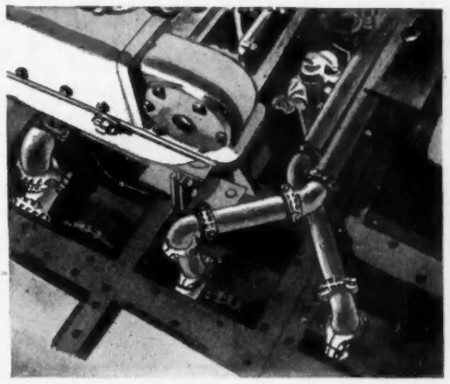
VICTAULIC COUPLINGS* are at work in many coal and metal mines far below the earth's surface and on hundreds of ships on the high seas. The flexible gaskets molded by United States Rubber Company resist a wide range of temperature changes, and can be used with safety on, above, or below the ground.



THE VICTAULIC GASKETS, of synthetic rubber, are impervious to the destructive action of high octane fuels. Victaulic Couplings can thus be used for pipe lines that convey oil, water, air, sludge!

THE FLEXIBLE SEAL of the flexible joint. Victaulic Couplings provide flexibility in pipe lines made of long lengths of rigid metal pipe. The flexible seal is formed by these gaskets, molded from synthetic rubber.

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UNITED STATES RUBBER COMPANY

PRACTICAL OPERATING *Hints* FOR THE DRILLING RIG

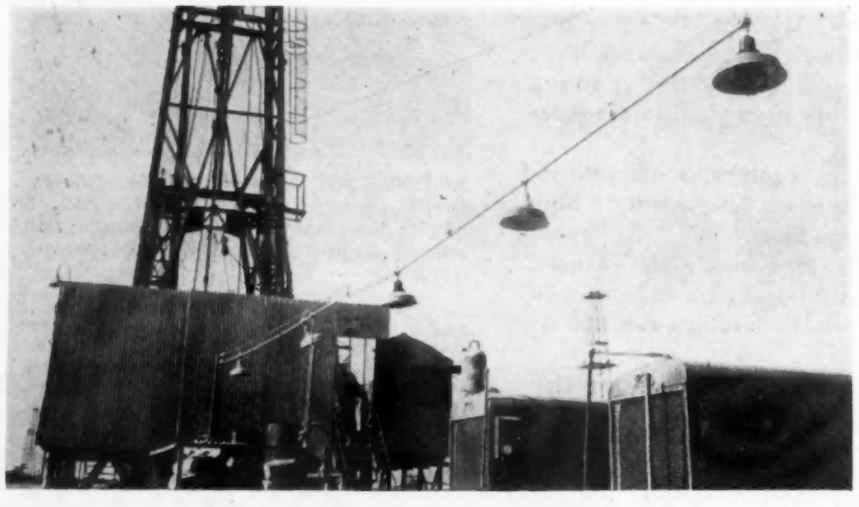
$5.00 will be paid for each illustrated acceptable contribution. Mail to The Editor, THE OIL WEEKLY, *Houston.*

1. RIG LIGHTING

Taut Guy Supports Conduit Sections

STRINGING electric light lines around the rig and over the mud pumps is usually a hurry-up job and seldom is care taken in properly insulating the wires or in supporting the line itself. One company has developed an efficient system in which the light wires are protected by sectionalized conduit and are strung along a tightly stretched wire line over the desired locations. Short hooks are clamped to the conduit at about every five feet, and once the line is strung up, it is very little work to push any length of conduit out over the inaccessible reaches.

A number of advantages result from this type of installation. Granting that the original cost may be slightly greater than the conventional wire system where the sockets are clamped to the pair of wires, the upkeep and replacement is very small and there never is any lost time caused by faulty contacts or broken lines when the lights are most needed on a stormy night. The present system allows use of heavier fixtures such as large, more efficient reflectors. Should lighting be required over a greater area, it is necessary only to add one or two sections of conduit to the already existing line. In tearing down, the wire line is reeled up and the sections of conduit are broken down and folded back on one another and tied into a bundle for easy handling while moving, the wire remaining inside the conduit all the while. The use of wire line has the added advantage that it can be stretched as tightly as desired, insuring dependable support for the lighting system, yet with no danger existing of breaking the electric lighting system, as would be the case with the older method of supporting the light wires.



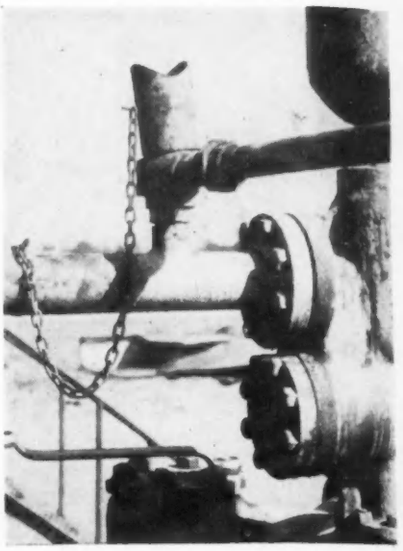
Protection for wires and exact spotting of fixtures is secured through the use of wire line and travelers permitting make-up of circuit from accessible stand at derrick.

2. SAFETY

Detachable Housing Checks Pin Travel

IT IS not uncommon on wells which are using a high mud pressure, to have the mud pressure relief valve go off frequently. In the case of the shear relief type of valve, the sheared ends of the pin occasionally may fly through the air with considerable velocity and are likely to cause damage or injury to a workman should he be struck with one of the fragments.

The crew of one rig solved this problem effectively and at trifling cost by placing a housing around the shear relief valve. It consists of an 8-inch length of 4-inch pipe which is set down over the body of the valve. To assure the housing being with the pumps at all times and during moving, it is attached to a chain welded to a nearby mud line.



Guard of scrap pipe, chained to prevent loss, snubs pin velocity and directs flow of mud.

The housing in no way affects the efficiency of the valve, as mud and gas can escape upward without constriction.

3. SERVICING

Rat-Hole Recess Aids Swivel Check

IN THE interest of convenience and safety while servicing the swivel, some rotary crews on heavy rigs build a scaffolding that may be extended from the first girt out over or beside the swivel when the kelly is in the rat-hole. While this is practical on heavy rigs, another simpler means may be employed on smaller portable rotary rigs.

Instead of going up to get at the swivel, the rat-hole is deepened several feet more and a special large sheet steel "bucket" is provided into which the kelly bushing may be set, thus permitting the swivel to come down to within arm's reach for easy servicing. Recessed in the derrick floor, the all-welded steel container extends down to the rat-hole pipe beneath the floor. It has openings at several points in the sides and in the bottom to permit run-off of excess mud. Great strength is not needed in construction as the bushing and kelly are supported on the top of the rat-hole pipe as usual.

When not in use, the bucket is kept

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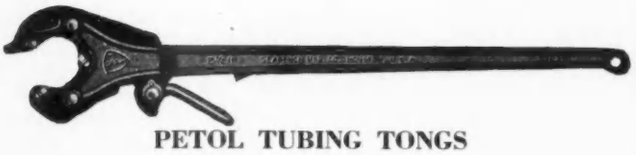

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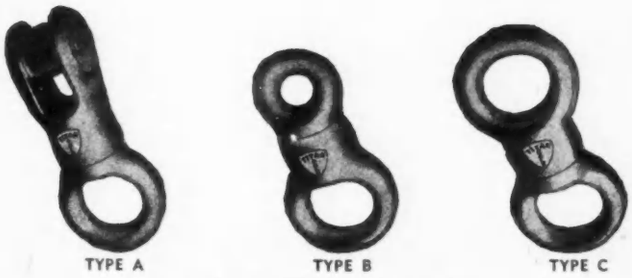

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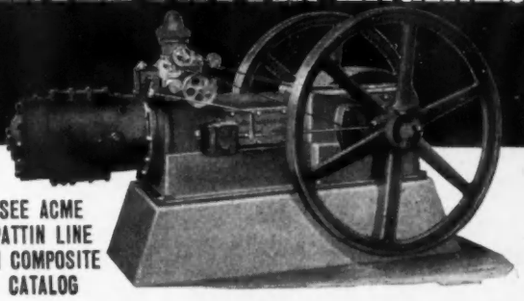

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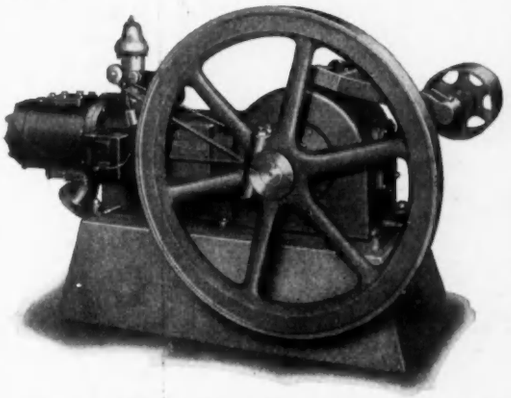

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Recess at top of rat-hole accommodates swivel when cover is swung aside to permit levelling.

closed by a hinged steel disk which may be quickly opened or closed with a convenient rope handle. Elimination of the usually-projecting top of the rat-hole pipe above the derrick floor also provides more floor space when the hole is covered.

4. PIPE HANDLING

Modified Buggy Cuts Unit Demand

BY MODIFYING the pipe buggy to permit handling a wide range of pipe sizes, one drilling contractor was able to make a single buggy do the work of two different sized units. An equilateral triangle-shaped quadrant of 5/16-inch steel plate was cut out and a series of ½-inch holes were then drilled at approximately 1-inch intervals along the circular forward edge. The plate was welded in a vertical position.

The short pipe-lifting prong was welded to the end of a pivoted strap iron fork, the latter having a hole corresponding to any one of the arc of holes drilled in the quadrant. A steel pin attached to a short chain is used to lock the prong at any desired height.

Permitting the lifting of practically any size casing used in the well, this buggy also is of value in carrying smaller sizes of pipe over rough ground where it is desirable to hoist the pipe up as far as possible to speed handling and eliminate dragging.

5. VALVE REPAIR

STANDARD 2-inch brass or bronze body valves are frequently in good condition when being salvaged except that the threaded ends are slightly out of round. At the same time, the pull of the pipe line may have elongated the body until the wedge seats improperly.

As a corrective for both these difficulties, a company that has made a practice of reconditioning every fitting and valve which can be repaired economically has designed a press for use in the machine shop. As the hexagon of the screwed ends is approximately the same size on each valve of a given size, a thick block of steel is cut in half with each pair of halves forming the complete hexagon into which the 2-inch valve end will fit snugly before the two press halves come together.

A hand operated press with a heavy frame is used with these shaping blocks so that sufficient pressure can be exerted on the hexagon end to reshape when out of true. If the same valve has been elongated to disturb the seating of the wedge, the press is opened wide by taking out two spacers and the valve then set endwise in the press. Lifting the wedge slightly off the seat allows sufficient compression to bring the body back to its original condition.

Adjustable lever on quadrant welded to pipe-buggy handle enables spud to be set to match any size of pipe being run without demanding excessive leverage to assume load.

Petroleum Reservoir Efficiency And Well Spacing

PART II — RECOVERY MECHANISMS
(Continued)

From a report of Reservoir Development and Operation Committee of Standard Oil Company (New Jersey) Affiliated Companies and of Humble Oil & Refining Company

SECTION C
Water Drive

THE mechanism of oil displacement by water drive, the third of the three major oil recovery mechanisms, involves movement of water into the oil sand as gas and oil are withdrawn from the reservoir. The water displaces oil ahead of it and sustains reservoir pressure. The degree to which reservoir pressure is maintained depends on the relation between the rate of oil, gas, and water removal, and the rate at which the water advances through the sands. It is common to speak of edge-water in discussing water influx, but where water underlies the entire oil body, the water movement may be upward by the water table and inward from the outer edges of the reservoir.

Water drive may come about in two major ways, namely, (1) simple artesian flow from an outcrop of the reservoirs and at some short distance from the field, and (2) as a result of expansion of the water occupying the reservoir sand (or connected strata) in its extension away from the oil bearing portion. Study of the water influx in many fields shows that the latter is probably the most common source of water drive.

Displacement by water is inherently the most efficient natural oil recovery mechanism in most reservoirs, primarily because water tends to wet the reservoir sands and to displace the oil.

Conditions Required

The major requirements for realization of effective water drive are as follows:

a) The oil body must be in good communication with a permeable and continuous water bearing sand (usually the regional continuation of the oil sand itself) of considerable areal extent, or outcropping at not too great distance.

b) The permeability of the sand must be fairly high, so that the rate of water advance can be sufficient to be of benefit within practical time limitations. Similarly, oil viscosity must be reasonably low.

c) The sands in the oil reservoir proper must be reasonably continuous and uniform so that effective flushing may be obtained.

d) Rate of fluid withdrawals must be restricted to a level commensurate with the ability of the water to advance evenly into the oil sands if maximum effectiveness of the flushing action, through avoidance of channeling and by-passing by the encroaching water, is to be realized.

While any reservoir open to a large water body has a potential water drive, the realization thereof within economic or reasonable time limits requires also that conditions be favorable; conversely, if they are not favorable, water drive may be unimportant. Looking at the mechanism as it is affected by sand and fluid characteristics, good sand permeability in the oil reservoir and in the water body will make a water drive more probable within a given depletion time period. Low viscosity is desirable both for its influence on the time factor and for the greater flooding efficiency which results from low oil viscosity. In many fields the conditions make water influx of only minor importance if depletion is to be effected over a period of, say, 20-25 years. Under such conditions, an efficient water drive may be obtainable only over a depletion period of, for example, some 60 to 100 years, which in many cases would be regarded as economically impractical.

The shape of the oil reservoir, relative to the length or area of the front along which the water must advance into the reservoir, is important because it governs the area through which the water may move into the oil body, hence bears on the rate of the advance. The presence of some structural relief is also of considerable benefit in water drive for practical reasons, such as ease of water control and the avoidance of channeling and by-passing. Structural relief affords better opportunity for the desired segregation of oil and water within the reservoir and thus the realization of even water advance. Since the amount of water produced with the oil influences the economic limit of operations as well as lifting and handling costs, the amount of structural relief may have a bearing on the depletion point to which a field may be carried under water drive.

Behavior Characteristics

Because water itself has an extremely low compressibility, the possibility of a water drive being an expansion process was overlooked for many years; it is now believed, however, that the effectiveness of the process is due, at least in part, to the fact that the water body in most water drive reservoirs is of considerable extent, so that even a comparatively small expansion would be more than sufficient to replace all of the oil withdrawn from the oil saturated portion of the reservoir body. In connection with the foregoing, note that the expansion concept of water drive involves a decline in potency of the water drive with time. Hence, even active water drive fields may show both pressure and production rate decline although, considering the large volume of water usually involved, this tendency to decline is not of great practical importance in most water drive fields.

As discussed in Part I, (THE OIL WEEKLY, Jan. 17, 1944) the saturation-permeability relationship governs the simultaneous flow of water and oil in the sand. It will be recalled, however, that the ratio between the viscosity of oil and that of water causes water displacement to be inherently more effective than gas and to result in the recovery of a relatively large percentage of the oil in place prior to the time that the water front breaks through. This relationship means that where water is a displacing agent, a comparatively high percentage of the oil in place will have been recovered from the flooded sand prior to the actual appearance of water in the well, assuming no water coning

or fingering. When water appears, the characteristic behavior under saturation-permeability relationships will be followed, with the water content of the produced fluid increasing until oil flow becomes negligible and water-oil ratios are prohibitive. While the viscosity factor alone gives water drive an inherently high oil recovery expectancy, the displacement action of capillary forces, not similarly operative in the gas mechanisms, also works toward effecting high recovery in water drive—since, as pointed out earlier, most oil sands are preferentially wet by water which is thus enabled thoroughly to displace oil. One result of this inherently high efficiency is that even a poorly controlled water drive may be capable of yielding fairly high oil recovery.

Water Drive Fields

In theory, the most efficient rate of production under water drive probably would be that at which the rate of fluid withdrawal would be restricted to a level commensurate with the ability of capillary forces to play a major part in displacement action. In such case, the maximum possible recovery would be realized with uniform water movement providing thorough flushing action. While it may be said that the greater the degree of restriction on oil withdrawal rate, the more thorough should be the water displacement, there will be for each reservoir a rate beyond which only insignificant additional oil recovery will be attainable by further restriction. For practical purposes, it is this level which is customarily considered as the "efficient" rate in the water drive mechanism. The efficient rate will vary widely with different reservoir conditions, in some cases requiring severe restrictions on rate of withdrawal but in others permitting a fairly high rate without appreciable loss in recovery. As a rough guide to the degree of restriction likely to be required for attainment of high efficiency, it may be said that in many present water drive fields having good sand conditions, a very high degree of oil displacement efficiency is apparently being obtained at withdrawal rates of about 3 percent to 5 percent of ultimate oil yield per year. At these rates, the water advance is enabled closely to follow-up the fluid withdrawals and maintain reservoir pressure to a substantial degree.

Channeling and By-Passing

As the rate of fluid withdrawal is increased beyond the efficient rate, the movement of water into a reservoir becomes uneven, due to channeling and by-passing. The degree to which these take place will depend on sand irregularity, being least in uniform sand and of possibly serious magnitude in very irregular sand. Inability of water advance to keep pace with withdrawals will result, of course, in pronounced pressure decline, possibly to the extent of the reservoir assuming a high degree of dissolved gas drive. The water drive then becomes a delayed or partial factor during the depletion period, the extent to which its displacement action is utilized depending largely on how long the field is operated.

Oil Recovery Expectancy

It has already been pointed out that under favorable reservoir conditions water drive is capable of yielding 60 percent to 80 percent of oil in place in most sands. That these figures may be closely approached in practice by efficiently controlled water drive fields is indicated by analyses of cores obtained from sands taken over by water advance in highly restricted fields in the Gulf Coast of Texas and the East Texas field, such core data being supported by calculations evaluating the displacement efficiency to date. It is believed from the behavior of such fields that they closely approach their efficient rates with relatively even water advance and substantial maintenance of pressure.

The possible loss in ultimate oil yield occasioned by withdrawal rates in excess of the efficient rate has not yet been fully evaluated, but any water advance during the economic life of a field will be productive of some increase in oil recovery over dissolved gas drive. Furthermore, on account of the high inherent displacement efficiency of water, if there is a high degree of water influx, even though poorly controlled, it can result in fairly high yields. This depends on the degree to which available water drive takes place. If too long delayed or of small magnitude, the recovery prospects will be governed by whichever one of the gas drive mechanisms is operative; whereas, if the water advance is of substantial importance over the economic life of a field, even though it may be partial or somewhat delayed due to inability to keep pace with early oil withdrawal rates, a fairly high yield may be obtained. Of course, such yields, even under the very best partial or delayed water drive conditions, will be considerably less than those attainable under efficient control from the beginning; oil loss, due to channeling and by-passing, as well as probable economic limitations imposed by excessive water production and long-time stripper pumping caused by early pressure decline, will reduce the recovery expectancy in fields operated inefficiently.

Field Examples

It was considerably more difficult in the Pool Studies to find clearcut examples of fields depleted under efficient water drive than was the case for substantially complete dissolved gas drive or substantially complete gas cap drive. This was chiefly because in many old fields in which water drive is now known to have been an important recovery mechanism, the water drive occurred as a delayed drive rather than a primary drive, and insufficient data on the reservoir and reservoir fluids are available for definite analysis. On the other hand, in most of the newer water drive fields on which the requisite data have been obtained, depletion has not reached a sufficiently advanced stage to make it feasible to define with reasonable certainty many features of overall field behavior under this mechanism.

In Newer Fields

Among the newer fields in which water drive is known to be the governing recovery mechanism are many Texas fields such as Conroe, Amelia, Friendswood, Anahuac and the East Texas field. These fields range in depletion from 5 percent or 10 percent to perhaps one-third. Hence, much of the picture on ultimate recovery efficiency and water production trend must be estimated over a rather long future. On the other hand, a great deal of study has been made of behavior of such fields, and partial water drive was very evident in several fields covered by the Pool Studies. This background, combined with the available data on old water drive reservoirs and the indications of research and laboratory work, provides a fairly dependable basis for arriving at a concept on the workings of this mechanism.

The East Texas field is a good example of a field where water drive could be considered the sole mechanism of recovery during the early life of the field before gas liberation. Figure 7 shows the production history of the field which, while not specifically covered by the Pool Studies, has been extensively discussed and studied by various agencies. An oil production rate of 400,000 barrels per day, which is representative of East Texas operations to date, is equivalent to about 3 percent of ultimate per year. At the current water production of about 50 percent of total fluid, the total withdrawal rate is approximately 6 percent per year.

Wide Variations

This reservoir is somewhat unusual in that the oil was considerably undersaturated with gas under original conditions; hence, despite wide variations in producing rate and decline in reservoir pressure, little gas has come out of solution and the reservoir oil has behaved largely as a homogeneous fluid. The field is a gently dipping monocline ap-

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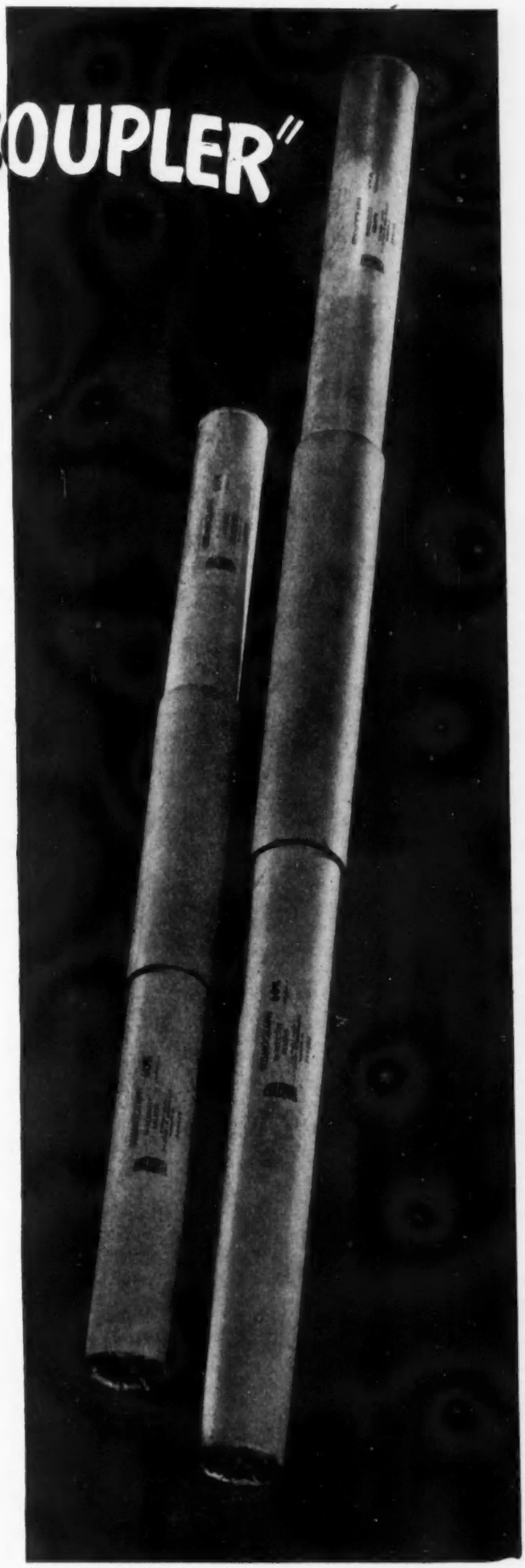

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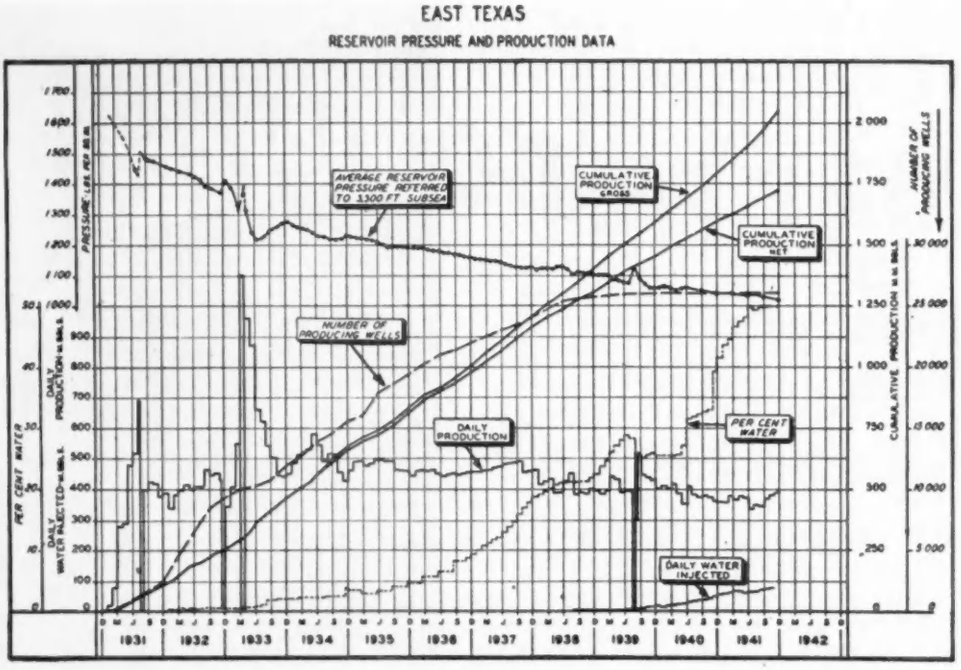

FIGURE 7

proximately 42 miles long and 8 miles wide, the producing sand pinching out on the east side. The sand is unusually permeable, averaging around 2000-3000 millidarcies, while the 39-degree A.P.I. oil has a low reservoir viscosity, and the sand body is sufficiently uniform and continuous to afford good conditions for realization of maximum recovery under a powerful water drive furnished by the extensive sheet of water-bearing Woodbine sand extending throughout eastern Texas. The field was only one-third depleted at the end of 1941, but various careful estimates of its possible ultimate recovery have agreed on a figure of some 5,000,000,000 barrels. This ultimate represents a yield of approximately 80 percent of the original oil in place, a close approach to the minimum residual oil saturation for this sand. As mentioned above, analyses of cores obtained from sectors taken over by the water advance indicate that yields of this magnitude have already been obtained from sand so far flooded by advancing water.

The trend of water production in a water drive field is of considerable interest and importance from an economic standpoint, particularly where oil treating and the disposal of water may be problems. In the East Texas field the water production currently represents 50 percent of the total fluid, as compared to an oil depletion of approximately 33 percent; from experience in older fields, it is expected that the water percentage trend will rise less rapidly in the future, although it will of course approach 100 percent as the limit at oil depletion, economics governing the point at which operations must be abandoned.

Variation Between Fields

While the water production trend in East Texas is roughly representative of the average in many water drive fields, there will be much variation between fields, depending upon conditions under which they are produced. For example, in a wholly owned or unitized field, it is probable that a program of careful well control, involving the shutting in of wells producing substantial quantities of water and a well planned campaign of plug back work, could well result in a considerably lower percentage of water at any stage of depletion than is the case in the East Texas field.

Unique Qualities

It was mentioned earlier that water drive has unique qualities of inherently high displacement efficiency so that even under poor control it may yield fairly high oil recovery. An example of a somewhat extreme instance, where unusually favorable conditions resulted in such high recovery despite unrestricted withdrawal rates, was found in the old Mexia-Powell group of fault-line fields in Texas. These fields are all long, narrow monoclines with very permeable sand and light oil, and had very active water drives. They were operated under substantially wide open flow with complete disregard of water movement, but the water advance very closely followed up the oil withdrawals to result in high but not precisely evaluated oil recovery. The committees concluded that the indicated high oil yield was largely attributable to the exceptional characteristics of the fields which included, in addition to high sand permeability and the presence of a potent water drive, relatively uniform sand conditions and a very large area for water influx. In view of the high rate at which these fields were depleted, the extremely close well spacing may also have tended to diminish the losses which otherwise might have been experienced due to channeling and by-passing.

Oil Left Behind

In general, the harmful effects of high rate of withdrawal in these fields were far less than could be expected in the usual reservoir of much less favorable sand and fluid conditions. Their efficient rate was probably quite high, and the deviation was much less than for wide open flow in the majority of fields. Since available data would not permit precise determination of recovery efficiency in the Mexia-Powell group, it is difficult to say what loss they may have had, but later redrilling of certain portions of the fields indicates that appreciable quantities of oil were left behind and that they did not realize the full extent of the recoveries anticipated from the present high pressure, restricted rate fields.

While none of the fields covered in the Pool Studies was representative of full high pressure water drive, several of the fields had partial or delayed water drives, among these being Lucien and Keokuk, while the Amelia field had a very powerful water drive combined with a large free gas cap.

☆ ☆ ☆ ☆ WASHINGTON ROUNDUP ☆ ☆ ☆ ☆

FOREIGN oil continued to bulk large in Washington developments last week as Chairman Wheeler of the Senate Interstate Commerce Committee, acting quickly on the Brewster-Moore resolution for liquidation of Petroleum Reserves Corporation, broke Congressional precedent by appointing a five-man subcommittee to handle the bill on which three of the members were Republicans and all five have been labeled "anti-administration" or "isolationist."

Senator Johnson of Colorado, named as chairman of the group, announced that he would initiate an immediate investigation of PRC and would hold public hearings as soon as the groundwork was laid.

Also in the foreign field, the State Department announced a strong policy of support for American oil operators abroad in the postwar period, and the directors of PRC went into session, reportedly to explore further the possibilities of a deal with California Arabian Standard Oil Company for development of the Saudi Arabia reserves of that company.

Of more immediate application was a revision of P-98-b by the War Production Board, under which much of the paper work previously required will be eliminated and the procurement of needed materials eased for production operators.

Other developments on the domestic front involved the steadily deteriorating Eastern transportation situation, to remedy which the Office of Defense Transportation urged the railroads to resume the movement of symbol trains at the high speeds of last year and called on the industry to speed up its handling of cars at terminals. ODT also initiated an effort to secure the allocation of steel by WPB for the construction of a large number of railroad tank cars to insure the rail movement of 800,000 barrels daily. Currently about 63,000 cars are in this service as against 70,000 or more last year.

Favorable weather, however, is expected to give the East 10,000 barrels daily of crude oil more through the Big-Inch pipe line than was anticipated a month ago, the operating schedule for February calling for 300,000 barrels a day. The Little-Big-Inch line is still under test in the East but the western leg is being filled with gasoline; planning to run it at 50 pounds less pressure than originally contemplated. PAW believes it will deliver 225,000 barrels daily of gasoline and between 190,000 and 200,000 of heating oil at the lower pressure.

Production Operators Relieved of Much WPB Paper Work

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PRC Goes Ahead Planning for Middle East Operations

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Invasion Plans Put Eastern Oil Stocks Dangerously Low

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Anti-administration Senators Will Investigate PRC

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By B. F. LINZ
Washington Correspondent

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P-98-b Revisions Will Save Time for Operators Seeking Preference Ratings

Reduction of paper work and saving of time of operators in securing preference ratings for materials required in all branches of the industry are aimed at in a board revision of Preference Rating Order P-98-b announced January 26 by the War Production Board.

In most instances, under the revised order, operators will no longer be required to send delivery orders to Washington or to PAW district offices for countersignature before placing them with their suppliers, and for the most part such copies of delivery orders as are to be filed with PAW will be for information purposes.

By eliminating all references to Canadian Operators contained in the order as last revised on October 19, 1943, (THE OIL WEEKLY, October 25), application of the order is restricted solely to operators and operations within the United States.

The definition of maintenance and repair, originally covering the deepening, redrilling or plugging back of any well or the installation of pumping or other artificial lifting equipment, has been broadened to include the drilling or multiple-completion of any well, and the extension or the initial construction or installation of a field gas gathering line.

The term "operating supplies" is extended to chemicals, additives and blending agents.

Paragraph (c) of the October order has been redrafted, the word "repair" being dropped from its title, which now reads "priorities assistance for services and particular materials," as follows:

"(1) An MRO rating assigned by this order may be used to secure services to the extent consistent with Priorities Regulation 3.

"(2) No operator may apply a preference rating to obtain any material listed on Schedule A of this order.

"(3) No operator may apply a preference rating to obtain any material listed on Schedule B except in accordance with the procedure described in that schedule."

Other changes are made in the paragraph to bring them into conformity with the above, and it is also provided that priorities assistance may be obtained under the order for material to be used as "lease equipment" as defined in Petroleum Administrative Order No. 11.

The filing procedure is revised to provide that filing of delivery orders will not be required for controlled materials amounting to $100 or less, while one copy of the delivery order will be filed for information purposes where the total amount involved does not exceed $2500 and no single item has a value of more than $500; countersignature of the district official will be required only on orders totaling more than $2500 or including an item costing more than $500.

Text of Amendment to P-98-b, page 223

On rated items other than controlled materials, no filing will be required where $100 or less is involved, and one copy will be filed for information purposes on larger orders, except in the case of items listed in Schedule B on which countersignature is required.

To use a preference rating obtained for MRO material pursuant to a Form WPB-541 (PD-1a) application, an operator must place the rating and allotment symbol P-3 on the order. Where orders include items scheduled under WPB Order M-293, operators should mark the copies filed with PAW "M-293 Material," to expedite the transmission and handling of those orders in Washington.

Production operators also will have the use of a new allotment symbol, "PSO" (petroleum small order), to obtain up to 10 tons of carbon steel per quarter for use in production for other than maintenance, repair and operating purposes. This amount of steel will be separate for any allotment obtained under a PAW Form 35 application, to which it is to be a supplement, and will eliminate the need for filing an application by small operators who require less than 10 tons of controlled material, other than MRO material, during a quarter.

The new order drops the distinction heretofore made between operators who drilled more or less than 40,000 feet of hole in 1942, and to the extent that operations can be planned and the need

for materials determined, production operators requiring more than 10 tons of carbon steel a quarter and controlled materials for other than MRO use will be required to file Form 35 applications at least three months in advance of the quarter in which the materials will be used, although supplemental applications may be filed whenever an operator needs material in addition to that previously allotted. Delivery orders must be placed within 30 days after the Form 35 allotment is received by an operator.

Form WPB-541 may be used instead of PAW Form 30 to request a preference rating for machinery or equipment which is to be installed with the use of not exceeding $500 worth of material obtained through the MRO procedure and if the machinery or equipment is part of a complete operation having a total material cost not exceeding $5,000.

The WPB form also may be used instead of PAW-30 to request a preference rating for any material, regardless of cost, which will not be incorporated into a plant or other facility, unless a WPB order requires the use of some other form. All WPB-541 applications are to be filed with the nearest WPB field office.

To conform with the new WPB order, PAO-15 is amended to increase from $3000 to $5000 the maximum cost of an operation which may be undertaken without securing specific authority. The use of material will continue to be controlled by PAO-11, PAO-12 and PAO-15.

The new P-98-b amends Schedule A of the former order to provide that rotary rock bits and core bits may be secured without regard to preference ratings.

Schedule B is retitled "Schedule C" and a new Schedule B is provided, setting up the procedure to be followed to secure a rating for civilian defense devices, wooden filing cabinets, fire protective equipment, etc.

Federal Taxes Drop as Autos Are Restricted

Restrictions on the acquisition and use of automobiles cost the federal treasury $71,000,000 in actual and an additional several million in potential gasoline-tax collections last year, it is revealed by the Internal Revenue Bureau.

Receipts from the levy in 1943 amounted to $265,303,272 compared with $336,684,645 in 1942, the bureau reported January 25. For the current year a further decline of $15,000,000 or more is anticipated.

While gasoline revenues declined, receipts from lubricating oil and pipe-line transportation both increased, the former from $41,226,446 in 1942 to $49,210,861 last year, and the latter from $13,920,707 to $14,264,179.

December receipts of all three taxes showed an increase over the preceding month, and gasoline was the only one to fall below December of the year before. Gasoline-tax collections for the month were $24,575,025 compared with $23,575,563 in November and $28,453,074 in December, 1942; while lubricating oil returned $3,697,398 against $3,292,418 and $3,527,980 and pipe-line transportation $1,561,819 against $976,550 and $1,337,659.

Americans to Operate on Equal Terms In Development of Foreign Oil Areas

A definite policy of strong support for Americans operating in foreign oil fields has been adopted by the State Department's newly created Office of Foreign Affairs.

This policy was disclosed last week by Harry C. Hawkins, director of the office, in a radio broadcast outlining the wartime and postwar economic activities of the department.

The Atlantic Charter is to work both ways, Hawkins declared, and under it the United States as well as other countries are to be enabled to operate on equal terms in the world's raw materials markets, and to that end the industry will have the backing and the assistance of the State Department.

Hawkins made no mention of the possible incursion into the foreign field of Petroleum Reserves Corporation, currently under fire in Congress where Senators Brewster of Maine and Moore of Oklahoma have introduced a resolution calling for its dissolution. That resolution has been referred to the Interstate Commerce Committee, chairman of which is Senator Burton K. Wheeler of Montana, a leader of the prewar isolationist bloc. Secretary of State Hull is a member of the PRC directorate.

"The Atlantic Charter provides that all countries shall have access on equal terms to the world's raw materials," the State Department official told the country. "That doesn't apply just to foreign countries. It applies to us as well.

"Americans are already developing great oil fields abroad. The State Department welcomes and wants to encourage this development. The department will certainly see to it that the interests of American nationals in foreign oil resources will get an even break."

In the course of the broadcast, Assistant Secretary of State Dean Acheson explained that the shipment of oil to Spain has been one of the measures of economic warfare taken by the Washington government, under which "deals" are made whereby we assure neutral countries of their minimum requirements of essential products in return for the withholding of needed materials from the Axis.

Acheson explained that the oil allowed Spain has been taken from the Caribbean area and transported in Spanish ships, which are closely checked, as is the distribution of their cargoes, to see that none of the oil is re-exported from Spain. The quantities going to Spain in this manner are far short of that country's normal supply and are limited to amounts barely sufficient to keep essential services going.

"These controls have been in effect since 1942 and we have received no evidence indicating diversion to enemy destinations or enemy uses," he said.

That this policy is being followed consistently was indicated January 28, when it was disclosed that shipments of oil to Spain will be suspended through February while Washington re-examines that country's position as a neutral.

Spanish neutrality has been under fire in England for some time, particularly since bombs were found in cargoes of Spanish oranges destined for Britian, and it is said there are a number of matters in which neither London nor Washington is satisfied.

The decision to suspend oil supplies, it is said, was the culmination of a long series of incidents, the most recent being the granting of a credit to Germany with which to purchase stragetic materials the Allies are anxious to keep from the Nazis.

High Oil Prices on Long Contracts Outlawed

Long-term contracts for the purchase of crude oil, under which 1944 deliveries were to be bought at prices higher than those prevailing during the period prior to October 1, 1941, have been outlawed by the Office of Price Administration.

Under an amendment to Maximum Price Regulation 436, effective January 29, the maximum price under such contracts is to be that at which deliveries were made prior to October 1, 1941, or within 60 days thereafter, if the contract was then in effect, or the purchase price posted October 1, 1941, if no deliveries were then made under the contract.

Specifically, the amendment provides that "where a contract was in effect on October 1, 1941, for the purchase of crude petroleum at the receiving tank at a price in excess of the highest posted purchase price for the given pool applicable to such production and deliveries were made prior to or within 60 days after October 1, 1941, in accordance with such contract, then the price actually charged on October 1, 1941, or on the first delivery after October 1, 1941, shall be the maximum price for the production covered by the contract."

The OPA explained that the provision is designed to deal with certain long-term contracts negotiated prior to the base date, providing for deliveries to start this year, with a view to carrying out "the original intention to hold crude-oil prices at the producing well to the levels actually paid on October 1, 1941."

New Oil Shortages Seen For Eastern Seaboard

PAW officials have begun to condition the East Coast to the probabilities of new oil shortages, warning that heavier off-shore movements in anticipation of the invasion of Europe and recent critical developments in the transportation situation are placing civilian petroleum supplies in a "precarious position."

Although it has been known for months that plans for the invasion were under way, Deputy Administrator Davies said the "unforeseen" military movement has affected both overland and tanker shipments to a considerable degree.

"If we could have built up large

terminal and bulk-plant inventories on the East Coast, these would have cushioned the effect of the many transportation interruptions which now face us," he said. "But," he added, "the grave over-all shortage of petroleum has made it impossible to do this, and inventories cannot stand the tremendous winter drains without better transportation.

Administrator Ickes presented the situation bluntly, declaring that "no predictions or scares are involved in our current deep concern about petroleum transportation to the East Coast."

"The facts are that recent developments, most of which could not be foreseen, have created new transportation bottlenecks which threaten East Coast civilian supplies of all petroleum products," he said.

"For the moment our inventories are adequate in most places along the East Coast, and we are moving in every direction to solve these new transportation problems. Most of the problems are only temporary, but unfortunately we do not have large enough inventories to carry us through the spring when many of the difficulties will be corrected more or less automatically.

"Every oil man, railroad man, barge man, and everyone else who has anything to do with the transportation of petroleum is urged to save every minute in the operation of the facilities with which he is concerned. We can not interfere with military movements, and we must get every ounce of work out of the facilities that are left us to use."

House Committee Plugs Along on Elk Hills Deal

The House Public Lands Committee last week was making heavy weather of its investigation of the Navy-Standard Oil Company of California contract for development of Elk Hills, based on legislation before it to extend Naval Reserve No. 1.

The committee plugged ahead with its inquiry, even though it had been made plain that the legislative emphasis would be laid on a bill to be proposed by the Navy amending the 1938 act to legalize the second contract with Standard Oil Company of California, on the validity of which Attorney General Francis Biddle, before the House Naval Affairs Committee last month, refused to give a yes or no answer but suggested legislation to settle all doubts.

During the week, the Public Lands Committee held its third and fourth hearings at which Rear Admiral Harry A. Stuart, director of naval reserves, attempted to wade through a 27-page statement he had prepared.

Speaking of the statement, Stuart told the committee that he regarded the contract as a purchase of the company's lands within the meaning of President Roosevelt's letter of March 21, 1942, authorizing the purchase, if possible by application of royalties to the purchase price, or, failing that, condemnation of the company's holdings.

Also, he pointed out, the intention of Congress as manifested in the consideration of the Act of June 30, 1938, authorizing acquisition of the lands, was that condemnation "was to be resorted to only after all else failed."

"In the spring and summer of 1942, condemnation did not seem to provide the whole answer to our problem," Stuart said, "because it seemed to be confined to lands within the reserve while the Navy's interest required doing something about the company's lands within the structure and outside the reserve."

Stuart asserted he still believes the November, 1942, contract to have been a good one, and pointed out that it was signed by Secretary Frank Knox only after it had been approved by the President.

"I have no apologies to offer for the course I elected to follow," he said. "I thought it was right then; I think it is right now."

The week's hearings were enlivened by a clash between Representatives White of Idaho and Elliott of California, precipitated when the former called Elliott an "arduous advocate of Standard." Elliott had objected to what he called an attack on the company by other members merely because it was a large operator.

"We are at war and need the support of every company whether it is little or big," declared the California member, in whose district the reserve is located, "and it seems like the general feeling here is to attack the Standard Oil Company because they are large operators."

White retorted that California was to be congratulated on "having such an arduous advocate of the Standard Oil, who came into the picture and took the Navy's oil and didn't pay a cent."

During the hearing, Stuart challenged the right of the Department of Justice to pass on the contract with Standard, declaring that Navy procedure did not require that scrutiny of details and the department's function was simply to clear titles and handle other legal matters.

The Standard contract which was cancelled following Department of Justice disapproval, he said, was similar to other oil reserve contracts still in effect.

The Kern County Land Company, which also owned land in the reserve, was brought into the picture by Representative O'Connor of Montana, who inquired why the Navy had been in a "hurry" to condemn its holdings while shying away from similar action with respect to Standard.

Stuart said the Kern Company was "not so little" and explained that condemnation was initiated when the company refused to delay drilling and because he considered too high price of $2,000,000 which it asked for its land.

Make-up of PRC Investigating Body Is Intensely Anti-Administration

Administration plans for government oil operations abroad through Petroleum Reserves Corporation this week are facing an intense and highly unfriendly investigation by a senate committee.

In an unprecedented action, Chairman Burton K. Wheeler of the Senate interstate commerce committee on January 26 appointed a subcommittee on which three of the five members are Republicans and the other two isolationist anti-administration Democrats, to take charge of the Moore-Brewster resolution calling for the liquidation and dissolution of PRC.

Senator Edwin C. Johnson of Colorado was named as chairman of the subcommittee. Wheeler himself is the only other member from the Democratic side, while the Republican members will be Senators Clyde M. Reed of Kansas, C. Wayland Brooks of Illinois and E. H. Moore of Oklahoma, co-author of the measure.

The make-up of the subcommittee alone was sufficient evidence of Wheeler's intention to "go to town" on PRC and, through it, the administration's whole program for post-war collaboration abroad.

The dissolution resolution was cleverly designed to rivet the attention of the isolationist bloc in Congress on Petroleum Reserves Corporation, charging that government activities abroad would constitute a "policy of imperialism," would "involve this government in dangerous and entangling difficulties with foreign governments" and "may well be a growing source of future international disputes and may contribute to those international feelings which arouse national pride and hatred and bring about international conflicts."

The political balance of the PRC subcommittee was in sharp contrast to another subcommittee recently appointed to handle the Reed-Clark-Wherry bill to centralize in PAW all oil functions of the Office of War Mobilization, the Office of Economic Stabilization, War Production Board, Price Administration, Office of Defense Transportation and National War Labor Board.

That subcommittee also will be chairmanned by Senator Johnson, but will retain the historic balance between majority and minority parties, with Senators D. Worth Clark of Idaho (Democrat) and Clyde M. Reed of Kansas (Republican).

Apparently undisturbed by the furor at the capitol, the director of PRC met last week, reportedly to discuss long-pending projects for engaging in Middle East operations with California Arabian Standard Oil Company and Gulf Oil Corporation.

There was no indication what PRC is working out in the form of arrangements, but it is known that two proposals to California Arabian Standard Oil Company, one of which, it is understood, involved the acquisition of a 51-percent interest and the other the placing of two government representatives on the board, have proved inacceptable to the company.

The Gulf Oil Corporation situation is somewhat different, complicated by its agreement with Anglo-Iranian Oil Company under which it cannot sell its Arabian production in areas served by the British company, and it was reported that the State Department has been negotiating with the British government for a revision of the agreement.

It was said that PRC is prepared to spend large sums in Middle East development, a figure of $100,000,000 hav-

ing been mentioned in connection with California Arabian Standard Oil Company. The corporation has a $1,000,000 capital furnished by RFC and a commitment for a loan of $30,000,000, and is said also to be in a position to draw practically unlimited amounts.

It has been Ickes' position that he has the responsibility to assure this country of an adequate supply of oil, in peacetime as well as war.

The Foreign Economic Administration also was drawn into the picture, with reports that it was about to expand its petroleum activities, but officials said there had been no change in the score of its operations. Its oil division is part of a requirements and supply branch and is headed by George Mattingly, who came to FEA with the Office of Economic Warfare last year.

It was explained that the petroleum division always has had the job of checking on licenses for the commercial export of oil, as well as practically everything else, and has been the licensing agent for equipment shipments to foreign countries, including those for operations of American companies.

FEA also handles questions of lend-lease supplies and, what officials consider most important, is engaged in constant analysis of the oil situation throughout the world, in this connection working closely with the British ministry of economic warfare.

The information which FEA secures regarding oil abroad is of considerable importance to military operations, since it maintains a check upon enemy supplies as well as upon those of neutral countries, and provides the basis for the planning of raids on enemy oil installations and other military activities.

FEA works in close harmony with the State Department, which sets the policies it follows in passing on shipments to neutral countries.

Light-Weight Tubing Is Again Allowed by WPB

The War Production Board announced last week that it has permitted resumption of the manufacture of light-weight tubing, used largely by gas-well operators in the Eastern area, production of which has been suspended since April, 1943.

Large quantities of the tubing are normally used and the needs of the Eastern operators warrant fabricating it, WPB officials said. Savings in material, however, will be achieved by the use of lighter weights.

Under a revision of Limitation Order L-211, Schedule 9, the production will be permitted of 8⅝-inch, outside diameter, seamless and electric-weld casing, Grade J-55, with a wall thickness of 0.264-inch and a nominal weight of 24 pounds per foot, and two sizes of seamless and electric-weld standard tubing (non-upset), Grades F-25, H-40, J-55 and H-80, one, nominal size 2, with an outside diameter of 2.375 inches and a wall thickness of 0.167-inch, nominal weight 4 pounds per foot, and the other, nominal size 3, with outside diameter of 3.5 inches, wall thickness of 0.216-inch and nominal weight of 7.7 pounds per foot.

ODT Seeks Tightening of Oil Delivery Service

Railroads and oil companies were jacked up last week by the Office of Defense Transportation in a directive calling upon the former to re-issue last year's orders requiring that oil traffic be given priority handling next to troop and other special war movement and instructing the companies to resume the "very prompt loading and unloading" of cars and trucks, 24 hours a day, every day in the week.

At the same time, ODT urged the War Production Board promptly to release new commercial vehicles to be used in highway movement of oil and products and requested the assignment of 21 Interstate Commerce Commission service agents and 40 Association of American Railroads car service division representatives to give special attention to the movement of tank cars.

Aroused by reports that deliveries to the East have been falling off, due to the deterioration of tank trucks, the slowing down of rail movement and the necessary diversion of tank cars from East service because of imperative war requirements for other movements, ODT Director Joseph B. Eastman began an immediate tightening up of the rail and truck service.

"A critical situation exists in petroleum transportation which requires action upon the part of all of those concerned with it," Eastman said in a letter to the oil companies. "There has been a slow-down of the movement and handling of tank cars and tank trucks which has resulted in deliveries substantially below those O.K. a few months ago in the face of increasing demand to meet direct and indirect requirements of the war.

"This slow-down has resulted in a serious and still growing shortage of tank cars and tank trucks which must be corrected by increasing operating efficiency on the part of shippers, carriers and receivers.

"I quite realize that some of the more important causes of this slow-down, such as shortages of manpower, affect the petroleum industry as well as the transportation agencies. However, I feel that the shippers and receivers of petroleum can do a great deal to improve the situation."

To aid in relieving the critical tank truck situation, the ODT has taken steps to expedite the release of heavy-duty trucks and tractors to petroleum transportation under the allocation procedure which it administers.

Plans to ask the War Production Board to make additional steel available for the construction of tank cars to bring the movement to the East Coast from its present approximately 675,000 barrels a day to at least 800,000 barrels daily were under consideration last week in Washington and New York, representatives of ODT, the American Association of Railroads and the Eastern Carriers meeting in the latter city January 28.

War Production Board figures indicate that steel requirements for the Maritime Commission and other claimant agencies will be met for at least the first six months of this year and that, if imperative, the allocation of metal for railroad tank cars may be possible.

It is estimated by AAR that about 600 cars a day would be required to bring the Eastern movement up to 800,000 barrels. Since the beginning of the war, the carriers have been given only steel enough for the building of 3000 cars.

About 7000 of the cars in the seaboard service a year ago have been diverted to other services, from which it is difficult at this time to call them back, it was said.

Appropriation Approved For 1944 Tanker Program

The House Appropriations Committee on January 26 approved an appropriation of $6,776,000,000 and an additional $5,700,000,000 in contractual authority with which to carry out the 1944-45 ship construction program of the Maritime Commission.

The $5,700,000,000 authorized will permit the Commission to build a total of 2359 vessels, including 353 T-2 type tankers to cost $1,129,600,000 and 19 T-3 type to cost $65,308,000. The T-2 ships will be of 16,600 deadweight tons and will cost $912 per ton to build, or an average of $3,200,000 per vessel, while the T-3 tankers will be of 16,400 deadweight tons and cost $203 per ton or $3,332,000 each.

During 1944 it is expected to produce about 4,200,000 tons of tankers against 3,500,000 tons last year, the committee was told by Admiral Emery S. Land, chairman of the Commission.

During its hearings on the bill, the committee dipped briefly into the concrete barge program. Up to December 1, last, one self-propelled and 20 non-self-propelled barges had been delivered and 23 more had been launched, eight of them of the self-propelled type. The cost of these barges, it was shown, will range from $1,100,000 at the Barrett and Hilp yard at South San Francisco to $1,600,000 at the McCloskey & Company yard at Tampa, Fla. Up to the end of last November, $107,836,753 had been spent on the program, $12,755,610 of it for facilities, $2,648,146 for defense-plant facilities and $92,432,997 for construction.

The Maritime Commission last week announced that The Texas Company next month would trade in four over-age tankers as part payment for two new 141,000-barrel T2-type tankers now building at the Sun Shipbuilding & Dry Dock Company yard at Chester, Pennsylvania.

The company will buy the ships at wartime construction costs, less the cost of national defense features, and will ask no construction or operating subsidy.

The total price will be $6,000,000, the four tankers to be taken as a down payment in the sum of $2,498,580, the balance to be paid in 15 annual installments at 3½ percent interest.

The four tankers to be turned in, two of them 24 years old and the others over 26 years, have a combined deadweight tonnage of 39,660 as against 33,310 for the two new ships, a gross tonnage of 25,612 against 20,344, and a cargo capacity of 300,000 barrels of gasoline against 282,316 barrels, but their

speed is only 10 knots as against 14½ for the new vessels, so that the two ships will have a utility value not less than that of the four obsolete ones.

The traded-in tankers will be transferred to the War Shipping Administration for operation on behalf of the government to such extent as may be necessary during the war emergency, at the termination of which, if not lost, they are to be returned to the commission for immobilization under the Merchant Marine Act of 1936.

IPA Charges Bowles With Inconsistencies

The Independent Petroleum Association last week made public correspondence evidencing inconsistencies in the position of Price Administrator Chester Bowles on the question of a crude price increase. Letters written by Bowles to Frank D. Eager, Lincoln, Nebraska, and to Representative Homer D. Angell of Oregon, were compared by Russell B. Brown, IPA general counsel, in a letter to the congressman.

Bowles' letter to Eager was dated December 17; that to Representative Angell January 5. Those letters, Brown pointed out, were contradictory in the following respects:

"In the letter dated December 17, the OPA takes the position: 'Furthermore, the intensity with which wildcat drilling is, at present, proceeding bids fair to guarantee that crude oil supplies will be adequate to provide for all foreseeable future needs' and 'as is indicated in the accompanying tables, the net result of our exploratory effort from 1938 through 1942 has been a total addition to reserves almost twice the total withdrawals from underground resources during the same period. Consequently, our total reserves are today the highest on record.'

"In the letter of January 5 they state: 'Due to the petroleum demands of war, we need to drill more wildcat and other wells than ever before. The Office of Price Administration believes that to get more wells drilled special inducements should be offered.'

"In the letter of December 17, the office, referring to the abandonment of stripper wells, said: 'A higher level of prices than presently prevails would not, in our opinion, induce any considerable increase in supply. As an industry utilizing depletable natural resources, some abandonments of producing areas must be made from time to time at any price. However, currently high demands and strong monetary incentives have reduced the number of net abandonments of oil wells to the lowest level in 10 years, at the same time, the fabulously high prices currently being paid for both producing wells and areas have provoked intensified drilling campaigns.'

"However, in the letter dated January 5, the OPA said: 'It is important to keep in operation stripper wells, reaching the end of their productivity. Figures on our abandonments in 1943 are not available, but the 5422 wells abandoned in 1942 were the fewest abandoned in any year since 1932. However, in view of war needs the OPA favors offers of special inducement to keep stripper wells in operation.'

"It would be helpful if that office could advise which of these letters contain 'the facts' to which they so freely refer," Brown commented.

February-March Big-Inch Schedule Is Announced

New schedules for the Big-Inch pipe line, calling for its operation at its 300,000-barrel rated capacity, have been issued by PAW, increasing the movement in February and March over the 290,000 barrels a day to which a month ago it was contemplated the line would have to be limited during the midwinter period.

A definite schedule for February calls for the movement of 9,700,000 barrels of crude oil, 4,094,800 barrels from East Texas, 1,560,200 barrels from Southwest Texas and 3,045,000 barrels from West Texas, while tentative schedules for March and April call for 9,300,000 barrels during the former, to include 4,377,200 barrels from East Texas, 1,667,800 barrels from Southwest Texas and 3,255,000 barrels from West Texas, and 9,000,000 barrels during the latter, to include 4,236,000 barrels from East Texas, 1,614,000 barrels from Southwest Texas and 3,150,000 barrels from West Texas.

The tentative schedules announced last month called for 8,410,000 barrels in February and 8,990,000 barrels in March.

The schedule of oil to be sold to War Emergency Pipelines, Inc., at Longview for transportation through the line, final as to February and estimated for March and April, is as follows:

February. East Texas oil: The Atlantic Refining Company, 585,800 barrels; Central Pipe Line Company, 29,-

THE FIRST NATIONAL BANK IN DALLAS, THE SOUTHWEST'S LARGEST BANK, INVITES YOUR CONSIDERATION WHEN CHOOSING A BANKING CONNECTION OF UNDERSTANDING AND C'OOPERATION
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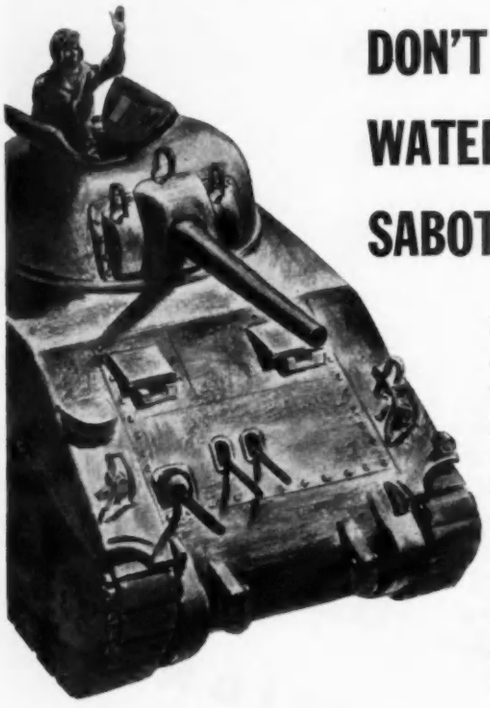
MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

000 barrels; Humble Oil & Refining Company, 812,000 barrels; Magnolia Petroleum Company, 133,400 barrels; The Pure Oil Company, 232,000 barrels; Shell Oil Company, 426,300 barrels; Sinclair Prairie Oil Marketing Company, 319,000 barrels; Sun Oil Company, 1,020,800 barrels; Tide Water Associated Oil Company, 536,500 barrels. Southwest Texas oil: Globe Oil & Refining Company, 380,480 barrels; Gulf Refining Company, 290,000 barrels; Houston Oil Company, 40,600 barrels; Humble Oil & Refining Company, 508,370 barrels; Magnolia Petroleum Company, 232,000 barrels; Sun Oil Company, 108,750 barrels. West Texas oil: The Atlantic Refining Company, 1,160,000 barrels; Gulf Refining Company, 435,000 barrels; Humble Oil & Refining Company, 1,450,000 barrels.

March. East Texas oil: The Atlantic Refining Company, 626,200 barrels; Central Pipe Line Company, 31,000 barrels; Humble Oil & Refining Company, 686,000 barrels; Magnolia Petroleum Company, 142,600 barrels; The Pure Oil Company, 248,000 barrels; Shell Oil Company, 455,700 barrels; Sinclair Prairie Oil Marketing Company, 341,000 barrels; Sun Oil Company, 1,091,200 barrels; Tide Water Associated Oil Company, 573,500 barrels. Southwest Texas oil: Globe Oil and Refining Company, 406,720 barrels; Gulf Refining Company, 310,000 barrels; Houston Oil Company, 43,400 barrels; Humble Oil & Refining Company, 543,430 barrels; Magnolia Petroleum Company, 248,000 barrels; Sun Oil Company, 116,250 barrels. West Texas oil: The Atlantic Refining Company, 1,240,000 barrels; Gulf Refining Company, 465,000 barrels; Humble Oil & Refining Company, 1,550,000 barrels.

April. East Texas oil: The Atlantic Refining Company, 606,000 barrels; Central Pipe Line Company, 30,000 barrels; Humble Oil & Refining Company, 840,000 barrels; Magnolia Petroleum Company, 138,000 barrels; Pure Oil Company, 240,000 barrels; Shell Oil Company, 441,000 barrels; Sinclair Prairie Oil Marketing Company, 330,000 barrels; Sun Oil Company, 1,056,000 barrels; Tide Water Associated Oil Company, 555,000 barrels. Southwest Texas oil: Globe Oil & Refining Company, 393,600 barrels; Gulf Refining Company, 300,000 barrels; Houston Oil Company, 42,000 barrels; Humble Oil & Refining Company, 525,900 barrels; Magnolia Petroleum Company, 240,000 barrels; Sun Oil Company, 112,500 barrels. West Texas oil: The Atlantic Refining Company, 1,200,000 barrels; Gulf Refining Company, 450,000 barrels; Humble Oil & Refining Company, 1,500,000 barrels.

Oil wins wars!



DON'T LET BOTTOM WATER SHUT-DOWNS SABOTAGE YOUR WELLS

Every barrel of precious oil you pump is a blow at the Axis! Don't let bottom water seepage stop it flowing for a single day. Be prepared with Eagle Lead Wool in your store room. It tamps easily into cracks and crevices around the bottom of the hole to make a solid, lasting, water-tight seal! Economical Eagle Lead Wool is rapidly installed in cartridge-shaped Eagle Wire Containers, sized to fit all casings. Safeguard against bottom water sabotage—order through your jobber today!

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Eagle Dreadnaught — for extreme speed and pressure conditions

Eagle Outlasta — for medium speed and pressure conditions

Eagle Durable — for low speed and pressure conditions

Less Pressure Planned For Little-Big-Inch

Some 70 breaks along the western leg of the Little-Big-Inch pipe-line have been repaired and the line is now being filled with gasoline from the Beaumont end.

Following the result of experience during the testing of the line, when it was found that the great majority of failures occured at pressures between 750 and 800 pounds, the line will be operated at a pressure of 700 pounds which, with all pumping stations in operation, will provide a daily capacity of 225,000 barrels of gasoline. This pressure will be 50 pounds below the designed pressure.

Testing of the eastern leg is now under way and, in view of conditions along the western leg, will be conducted at pressure of 750 pounds, or 50 pounds above that which it is now planned to use. With this lower testing pressure it is believed that the number of failures will be only a fraction of that experienced on the western section.

Petroleum Engine Parts Distributors Rating Upped

The Petroleum Administration for War has announced that distributors of petroleum engine parts may now obtain preference ratings with which to purchase their entire requirements of such items for all four quarters of 1944. Preference ratings for purchases for the entire four quarters will be granted on the basis of quarterly applications which may be filed for the four quarters of 1944. If requirements cannot be anticipated for the entire year, they should be estimated as far in advance as possible.

Rating of AA-1 has been made available for distributors of such items. After the application has been granted and the rating of AA-1 assigned, orders previously placed on lower ratings which have not been filled may then be uprated to AA-1. Applications should be filed on Form WPB-547 (formerly PD-IX).

Distributors are urged to file their applications at once. Applications should be sent by air mail to Myron C. Schoenly, Petroleum Section, Wholesale and Retail Trade Division, Temporary Building E, Washington, D. C.

Preference Rating Order P-98-b Amendments

As Issued Jan. 26, 1944

Chapter IX—War Production Board.
Subchapter B—Executive Vice Chairman.

Authority: Regulations in this subchapter issued under Sec. 2 (A), 54 Stat 6760 as amended by 55 Stat, 236 and 56 Stat 176; E. O. 9024, 7 F R 329; E. O. 9125, 7 F P 2719; WPB Reg. 1, as amended March 24, 1943, 8 F R 3666, 3698; Prt. Reg. 1 as amended May 15, 1943, 8 F R 6727.

Part 1041—Production, Transportation, Refining and Marketing of Petroleum.

(Preference Rating Order P-98-b as Amended October 19, 1943, AMDT 1).

The fulfillment of requirements for the defense of the United States has created a shortage in the supply of critical materials for defense, for private account and for export; and the following order is deemed necessary and appropriate in the public interest and to promote the national defense:

Section 1041.2 Preference Rating Order P-98-b as amended October 19, 1943, is hereby amended in the following respects:

(1) The following new sentence is inserted between the fourth sentence, which ends with the words "through this order," and the fifth sentence: furthermore this order will not be used by Canadian operators.

(b) The words "including Canadian operators" are deleted from the fifth sentence.

(2) Paragraph (a) (2) is amended by the addition of the words "unless use of the small order symbol is authorized" at the end of the third sentence which presently ends with the words "must be applied for." And by the insertion of the words "and symbol" in the fourth sentence between the word "number" and the word "may."

(3) Paragraph (a) (3) is amended by the deletion of the word "wither" from the third sentence between the word "to" and the word "the": by the deletion of the words "or the office of oil controller" from the end of the third sentence and the substitution in their stead of the words "unless the operator receives special instructions to the contrary"; and by the deletion of the word "certain" from the fourth sentence between the word "of" and the word "applicable."

(4) Paragraph (b) (1) is amended by the deletion of the second sentence in its entirety.

(5) Paragraph (b) (4) is amended in the following respects:

(a) The word "does" in the paragraph immediately following paragraph (b) (4) (11), which word is between the word "repair" and the word "not," is deleted and the word "shall" is substituted in its stead.

(b) The words "drilling" and "multiple completion" are added to the series of words immediately following the letter "(a)," and the sequence of the words in that series is altered to read as follows:

(a) The drilling, redrilling, deepening, plugging back, or multiple completion of any well or the initial installation on any well of pumping or other artificial lifting equipment, or

(a) letters "(b)" and "(c)" are relettered "(c)" and "(d)" respectively.

(d) a new series commencing with the letter "(b)" is inserted to read as follows:

(b) The extension or the initial construction or installation of a field gas gathering line, or.

(6) Paragraph (b) (5) is amended by the addition of the words "including among other items, chemical, additives and blending agents" at the end of the sentence, following the word "expense."

(7) The title of paragraph (c) is amended by the deletion of the word "repair," and paragraph (c) (1) and (c) (2) are amended and new paragraph (c) (3) is added to read as follows:

(1) An MRO rating assigned by this order may be used to secure services to the extent consistent with priorities regulation 3.

(2) No operator may apply a preference rating to obtain any material listed on Schedule A of this order.

(3) No operator may apply a preference rating to obtain any material listed on Schedule B except in accordance with the procedure described in that schedule.

(8) Paragraph (c) (3) through (c) (6), inclusive are hereby renumbered (c) (4) through (c) (7) respectively.

(9) Paragraph (c) (4), as renumbered from (c) (3), is amended by the substitution of the words "covered by" for the words "listed on" between the word "materials" and the word "schedule," by the substitution of the letter "c" for the letter "b" following the word "schedule" and by the addition of the following sentence as the second sentence: Schedule C includes all items on List B of Priorities Regulation 3 with the exception of those listed in Schedule B of this order.

(10) Paragraph (c) (7), as renumbered from (c) (6,) is amended by the deletion of the second sentence and by the substitution of the following sentence as the second sentence: "Priorities assistance may, on the other hand, be obtained under this order for material to be used as 'lease equipment,' as that term is defined in Petroleum Administrative Order No. 11."

(11) The title of Paragraph (d) is amended by the substitution of the words "preference ratings" for the word "rating." Paragraph (d) is amended by the insertion of the words "for use in any branch of the petroleum industry other than retail marketing" immediately following the word "material" and before the comma; by the deletion of the words following the symbol "AA-1" to the end of the sentence; and by the substitution of a period for the comma following that symbol. A second sentence is added to Paragraph (d) to read as follows: "To secure MRO material for use in retail marketing an operator may use allotment symbol MRO-p-3 and preference rating AA-5."

(12) Paragraph (e) (2) is amended by the insertion of the words "more than" between the word "of" and the number "$100," by the deletion of the words "or more" following the number "$100," by the inserting of the word "approximate" between the word "the" and the word "price"; and by the addition at the end of the sentence of the words "and the month in which delivery of the material is required."

(13) The introductory paragraph of Paragraph (e) (3) up to and including the colon is deleted and the following introductory paragraph is substituted in its stead: (3) Prior to placing each delivery order with a supplier, submit copies of the order to the district office of the Petroleum Administration for War for the district in which the material will be used (or, if so desired by an operator in any branch of the industry other than production for the district in which the purchasing office of the operator is located). REF materials division, as follows:

(14) Paragraph (e) (3) (i) is amended by the deletion of the words "less than" before the number "$100" and by the insertion of the words "or less" after the number "$100" and before the comma.

(15) Paragraphs (e) (3) (ii) through (E) (3) (iv) inclusive, are deleted and the following material is substituted in their stead:

(ii) If the delivery order is for controlled materials (other than aluminum) and has a total cost of more than $100 but not more than $2,500 and has no item of more than $500, one copy must be submitted for information purposes. (iii) If the delivery order is for controlled materials (other than aluminum) and has a total cost of more than $2,500, or has any item of more than $500, two copies must be submitted for approval and an operator may not place such an order with a supplier until approval of the order has been returned to him.

(iv) If the delivery order is for other than controlled materials or for aluminum, and has a total cost of more than $100, one copy must be submitted for information purposes.

(16) Paragraph (e) (3) is amended by the deletion of the three paragraphs within that subparagraph commencing with that paragraph which begins with the words "all orders for MRO" and ending with that paragraph which ends with the words "copy of such order," the final paragraph within that subparagraph, which paragraph will remain, is amended by the substitution of the letter "b" for the letter "a."

(17) Paragraph (e) (4) is deleted and the following material is substituted in its stead:

(4) An operator requiring aluminum as a controlled material need only comply with the previous subparagraphs of this paragraph (e) to obtain 500 pounds or less from all sources during a calendar quarter. If the quantity required is more than 500 pounds, he must apply by letter for permission to purchase the excess amount (furnishing the applicable information called for by paragraph (d) of Supplementary Order M-1-d to the Aluminum and Magnesium Division, War Production Board. Ref: M-1-i. If approved the operator must then place his delivery order in accordance with the previous subparagraphs of this paragraph (e).

(18) Paragraph (3) is amended by the addition of Paragraph (e) (5) to read as follows: (5) to use a preference rating obtained for MRO material pursuant to a form WPB-541 (PD-1a) application, an operator must place on the delivery order the rating and allotment symbol P-3.

(19) Paragraph (f) (3) is amended by the insertion of the word "approximate" before the word "price," and by an alteration in the sequence of the first four words to read, "quantity, approximate price and."

(20) Paragraph (g) is amended in the following respects:

(A) The last item in the series of special production operations there listed is deleted and the following item is substituted in its stead: A gas lift compression plant or a field gas booster plant where the material to be installed or added increase the rated capacity of the plant more than 500 h.p.

(B) In the last paragraph within that paragraph the words "and symbol" are inserted in the first sentence between the word "numbers" and the word "and."

(21) The title of Paragraph (h) is amended by the insertion of the words "symbol and preference" between the word "and" and the word "rating." Paragraph (h) is amended by the deletion of Paragraph (h) (1); by the renumbering of paragraph (h) (2) as (h) (3): and by the insertion of the following material as paragraphs (h) (1) and (h) (2), respectively.

(1) Application must be made for allotment of controlled materials, to obtain controlled materials for use in production, an operator must secure an allotment and an allotment number by applying on PAW Form 35, except that a small quantity of carbon steel may be obtained (without such an application) through the use of allotment Symbol PSO (Petroleum Small Order), as described in Paragraph (h) (2) immediately following. PAW Form 35 applications will be filed in triplicate (3) with the District Office of the Petroleum Administration for War for the district in which operations are to be conducted, Ref: Materials Division.

Operators should file PAW Form 35 at least three months prior to the beginning of the calendar quarter in which the controlled materials are to be delivered, where operations can be planned to permit such advance filing. Otherwise applications on that form should be filed not less than one month prior to the proposed delivery date of the controlled materials. Interim assistance may be requested at any time by filing PAW Form 35 as a supplemental application.

(2) Small order exception for carbon steel, as an exception to the rule stated in the preceding subparagraph that an operator must apply for an allotment of controlled materials, an operator may use Allotment Symbol PSO to secure the delivery of no more than 10 tons of carbon steel as a controlled material during any calendar quarter for use in production.

If an operator will require more than 10 tons of carbon steel in any calendar quarter, he should apply on PAW Form 35 for an allotment of the total quantity of his estimated needs in the manner described in the preceding subparagraph. By so doing, the operator will be able to use allotment symbol PSO to obtain up to 10 tons of carbon steel for unanticipated needs discovered after the application has been filed, and will thus be relieved of the need to file many interim applications.

(22) The title of Paragraph (i) is amended by the insertion of the words "symbol and preference" between the word "and" and the word "rating." The introductory matter in Paragraph (i) up to and including the colon is amended to read as follows: "To use his allotment number of symbol and preference rating, a production operator must:"

(23) Paragraph (i) (1) is deleted and the following material is substituted in its stead:

(1) Indicate on each delivery order for controlled materials the allotment number (and PAW Form 35 serial number or allotment symbol PSO (in the case of a small order); and indicate on each delivery order for other materials the preference rating and Allotment Symbol P-1; certifying each delivery order in accordance with Paragraph (r).

(24) Paragraph (i) (2) is amended by the insertion of the words "more than" between the word "of" and the number "$100;" by the deletion of the words "of more" following the number "$100," by the insertion of the word "approximate" between the word "the" and the word "price"; by the insertion of the words "if any" between the word "number" and the word "if;" and by the addition of the following material to the end of the subparagraph: "And the month in which delivery of the material is required."

(25) Paragraph (i) (3) is amended by the deletion of the matter in parentheses and the parentheses in the introductory matter and by the substitution of the words "Ref: Materials Division," in their stead.

(26) Paragraph (i) (3) (i) is amended by the deletion of the words "less than" before the number "$100" and by the insertion of the words "or less" after the number "$100" and before the comma.

(27) Paragraph (i) (3) (ii) and (i) (3) (iii) are deleted and the following material is substituted in their stead:

(ii) If the delivery order is for controlled materials, and has a total cost of more than $100 but not more than $2,500, and has no item of more than $500, one copy must be submitted for information purposes.

(iii) If the delivery order is for controlled materials and has a total cost of more than $2,500, or has any item of more than $500, two copies must be submitted for approval, and an operator may not place such an order with a supplier until approval of the order has been returned to him.

(iv) If the delivery order is for other than controlled materials, and has a total cost of more than $100, one copy must be submitted for information purposes.

(28) Paragraph (i) (3) is amended by the deletion in its entirety of the paragraph commencing with the words "an operator" and ending with the words "such order," which paragraph immediately follows paragraph (i) (3) (iii). The final paragraph, within that subparagraph, which paragraph immediately follows the paragraph deleted in its entirety, is amended by the deletion of the word

"asterisked" and by the substitution of the letter "b" for the letter "a."

(29) Paragraph (k) is amended by the deletion of the last item in the series of special production operations there listed and by the substitution of the following item in its stead: "A gas lift compression plant or a field gas booster plant where the material to be installed or added increases the rated capacity of the plant more than 500 h.p."

(30) The title of Paragraph (e) is amended by the insertion of the word "preference" between the word "and" and the word "rating." Paragraph (l) is amended by the deletion of all the material following the first sentence, and by the substitution in its stead of the following material as three separate paragraphs:

Form WPB-541 (PD-1A) may be used instead of PAW Form 30 to request a preference rating for machinery or equipment. If the machinery or equipment will be installed with the use of no more than $500 worth of material obtained through the MRO procedure of this order and if the machinery or equipment will be installed as part of a complete operation having a total material cost of no more than $5,000.

Form WPB-541 (PD-1A) may also be used instead of PAW Form 30 to request a preference rating for any material, regardless of cost, which will not be incorporated into a plant or other facility (for example, an item of construction machinery or equipment), unless a War Production Board order requires the use of some other form.

Form WPB-541 applications will be filed with the nearest War Production Board field office.

(31) The title of Paragraph (m) is amended by the substitution of the words "or symbol and preference" for the word "and" between the word "number" and the word "rating," and the paragraph is amended in the following respects:

(a) The first sentence, which ends with the letter "(r)," is deleted and the following material is substituted in its stead:

To use the allotment number and preference rating granted through a PAW Form 30 application an operator must place the allotment number on delivery orders for controlled materials and the allotment number and preference rating on delivery orders for other materials. On each delivery order for material rated after a Form WPB-541 application an operator must place the rating and either allotment symbol F-5 (in refining) or P-1 (in any other branch of the industry). Each delivery order must bear the standard certification of Paragraph (r).

(b) The second sentence is amended by the insertion of the words "or Form WPB-541" after the phrase "in connection with the PAW Form 30" and before the word "application," and this sentence, as amended, is to appear as a separate paragraph.

(c) A third paragraph is added to read as follows: Any rating or allotment number assigned pursuant to an application on either of such forms may be used without submitting delivery orders to the Petroleum Administration for War, unless the operator receives special instructions to the contrary.

(32) Paragraph (n) (1) is amended by the insertion of the words "as amended and supplemented from time to time" both at the end of the first sentence which ends with the number "15" and at the end of the second sentence which ends with the number "11;" by deletion from third sentence of the word "either" wherever it appears, and the words "or Form WPB-541;" by deletion from third sentence of the words "of these" and the substitution of the word "this" in their stead; and by the change in the third sentence of the word "forms" to the word "form" wherever it appears.

(33) Paragraph (n) (2) is amended by the insertion of the words "from time to time" at the end of the first sentence which presently ends with the word "supplemented" and by the insertion of the words "or an amendment or supplement to that order" in the second sentence between the symbol "PAO-12" and the comma.

(34) Paragraph (p) (1) is amended by the deletion of the words "less than" before the number "$100;" by the insertion of the words "or less" after the number "$100;" and by the deletion of the number "$1,000" and the substitution in its stead of the words "$2,500 or less."

(35) Paragraph (p) (3) is amended by the insertion of the words "where an allotment of controlled materials has been made and an allotment number authorized in connection with it," as the beginning of the first sentence and before the words "the allotment number;" by the insertion of the words "and Allotment Symbol PSO, in connection with production," in the second sentence after the word "material," and before the word "shall;" by the deletion of the word "an" from the second sentence between the word "constitute" and the word "allotment," and by the substitution of the word "symbols" for the word "symbol" between the word "allotment" and the word "for;" and by the insertion of the following sentence between the first sentence and the second sentence: "In the event that no allotment number has been so authorized, the appropriate allotment symbol stated in the order should be used."

(36) Paragraph (q) (1) is amended in the following respects:

(a) The first two sentences are deleted and the following sentence is substituted in their stead: "An operator who receives an allotment of controlled materials on PAW Form 35 must reallot the same or place delivery orders for such materials within thirty days after the allotment is received."

(b) The word "authorized" is inserted in the third sentence between the word "placing" and the word "controlled," and the word "period" is substituted in the same sentence for the word "periods" between the word "such" and the comma.

(c) The matter in parentheses in the third sentence and the parentheses are deleted.

(37) Paragraph (g) (2) is amended by the deletion of the words "or Form WPB-541" from the first sentence between the number "30" and the word "must;" by the substitution of the word "authorized" for the word "made" as the last word of the first sentence by the insertion of the word "authorized" in the second sentence between the word "placing" and the word "controlled;" and by the deletion of the matter in parentheses in the second sentence and the parentheses.

(38) Paragraph (g) (3) is amended by the deletion of words "Petroleum Administration for War or the Office of Oil Controller" from the fourth sentence and the substitution of the following words in their stead to complete the sentence: "District office (in the case of production) or of the Washington office (in all other cases)."

(39) Paragraph (r) is amended by indenting the second paragraph which commences with the words "the undersigned purchaser."

(40) Paragraph (u) (2) is amended by the substitution of number "(7)" for number "(6)" in the third sentence in the reference to Paragraph (c) (6).

(41) Paragraph (u) is amended by the addition of paragraphs (u) (4) and (u) (5) to read as follows:

(4) Privileges granted by other orders and regulations of the War Production Board to persons on Schedule I of CMP Regulation 5 shall be considered as applicable to petroleum operators, other than operators to the extent that they are engaged in retail marketing operating under this order. For example, Order E-5-A on gauges and precision measuring hand tools classifies a person on Schedule I or II of CMP Regulation 5 as an "approved user" with the stated exception, an operator covered by P-98-b is in identically the same position, provided that certification clauses in anl all other provisions of such other orders are complied with.

(5) Where a preference rating or allotment symbol, or both, is permitted or is required to be used by any other "E," "L," "M," "P," or "U" order or any regulation of the War Production Board to obtain a specific item of material, it will not also be necessary to follow any procedure of this order to obtain that item of material.

(42) Paragraph (w) is amended to read as follows: All reports required to be filed hereunder and all communications concerning this order should, unless other directions are given, be addressed to the Petroleum Administration for War, Interior Building, Washington 25, D. C., Ref: P-98-b.

The address of the Petroleum Administration for War District Offices are set forth in Schedule D.

(43) Schedule A is amended to read as follows:

The items listed on this schedule may be delivered to operators without regard to preference ratings. No operator shall apply or extend any rating to get any of these items and no person selling any such item shall require a rating as a condition of sale.

Items on List A of Priorities Regulation 3, rock bits and core bits (rotary bits).

(44) Schedule B is relettered Schedule C and is amended by the substitution of words "nearest WPB field office" for the words "PAW, Washington" where they appear under the column entitled "filing instructions" opposite items lettered (a), (b), (c) and (f), and by the insertion of the following material as an introductory paragraph.

The special MRO procedure of Schedule B may be used to request a rating for only those items on List B of Priorities Regulation 3 as MRO material which are listed on that schedule. Many of the other items on List B of Priorities Regulation 3 may be secured without a preference rating and every attempt should be made to do so. If a rating is required for any of these remaining items or for any other item which cannot be secured with a blanket MRO rating it should be applied for on Form WPB-541 (PD-1A), filed with the nearest WPB field office. There are two general exceptions to this rule. In the first place, laboratory instruments and equipment may be obtained under the regular MRO procedure of this order and secondly, the forms indicated below will be used for the items there listed.

(45) A new Schedule B is inserted to read as follows:

Schedule B

The procedure established by this schedule must be followed in order to request a rating for any item listed on it. Certain of these items are on List B of Priorities Regulation 3, and any rating secured under this procedure for such an item is not a blanket MRO rating and may be used to secure such item.

In order to request a rating under this procedure two copies of each delivery order (regardless of amount) must be submitted to the District Office of the PAW of the district in which the material will be used (or, if so desired by an operator in any branch of the industry other than production, for the district in which the operators purchasing office is located) for each such delivery order. In addition to the statement which must regularly accompany an MRO delivery order submitted to PAW concerning the specific use to which the material will be put, the operator should include a detailed explanation of why he requires the particular item requested. An operator may not place a delivery order with a supplier covering these items until approval of such order has been returned to him. For convenience this will be referred to as the "special MRO procedure."

The following materials are covered by this schedule:

(a) Those items currently identified on and more completely identified on (and more completely described in) List B of Priorities Regulation 3 as follows and any equivalent items replacing them on revisions of that List B, when required as MRO material:

Description:

Civilian defense devices,
Filing cabinets, wooden,
Fire protective equipment,
Furniture for use in office, factories, industrial establishments and institutions, except furniture specifically designed for schools.
Medical, surgical and dental equipment and supplies (except parts for the maintenance or repair of existing equipment).
Medical, surgical and dental instruments, slide rules, precision engineering, having a list price of $7.50 or more.
Venetian blinds.

(b) Construction machinery and equipment (on Schedule B or Order L-192) costing in excess of $500, when required as MRO material or as material for use in production.

(46) Schedule C is relettered Schedule D.

Issued this 26th day of January, 1944

WAR PRODUCTION BOARD

By J. Joseph Whelan, Recording Secretary

F R Doc 44-1357: Filed January 26, 1944, 11:34 a.m.

P-98-b Ratings Ruled Not "Blanket MRO's"

An interpretation of Priorities Regulation 3, holding that P-98-b ratings for maintenance, repair and operating items on Schedule B of the oil order are not "blanket MRO ratings" under the regulation, was issued January 24 by the War Production Board.

The P-98-b ratings, it was explained, are assigned to specific purchase orders for a specific kind and quantity of the material desired.

"Therefore," it was said in the interpretation, "when a rating assigned pursuant to Schedule B of P-98-b (as evidenced by the symbol MRO-P-3) is applied to a purchase order for any item which is set out on Schedule B of that order that rating is valid, despite the fact the item is also on List B of Priorities Regulation 3.

"The order does not require the purchaser to furnish a copv of his approved purchase order to the supplier, and the supplier should give effect to the rating and certification unless he knows or has reason to believe that the purchase order has not been rated as provided in Schedule B of Order P-98-b."

Transportation Facilities Manufacture Looks Up

Production last year of equipment for domestic transportation facilities was less than desired, but the outlook for 1944 is better, it was declared January 25 by ODT Director Joseph B. Eastman.

Deliveries during the year, Eastman reported, included 269 wooden barges, 54 steel barges, 75 tugboats and eight towboats.

Refinery Products Show Good Gain for Week

For the week ending January 22, crude runs to stills took an upward swing as compared with a week ago, with a corresponding increase in the output of all manufactured products. The most notable gain was in the daily average amount of residual fuels produced, with gasoline following a close second, and gasoil and distillates third. Daily average production of crude oil also showed a gain for the week.

Notwithstanding increased output of all products, most stocks declined in the face of continued phenomenal demands for heating oils and the constantly increasing military requirements for motor and engine fuels of all classes. The demand for civilian fuel for heating is seasonal and will probably reach its peak during February or March. PAW has warned that the balance between the supply and demand of fuel oil is delicate and can only be maintained by the most rigorous conservation.

The supply situation is menaced by a hovering threat of transportation shortages such as the wearing out of tank trucks and congestion on the railroads to the point where temporary local shortages of fuel may result.

The margin by which stocks have to be depended upon to meet the demand for heating oils is indicated by the fact that although production of this type of fuel gained 582,000 barrels during the week, stocks dropped by 896,000 barrels. As compared with stocks a year ago, the present total is 25.5 percent below last year's figure.

Production of gasoline rose 315,000 barrels daily during the week with a resultant increase in stocks amounting to 1,206,000 barrels. The gradual gain in stocks over the past several weeks is not unusual. Civilian consumption of gasoline is not able to show much variation under rationing, except insofar as favorable or unfavorable weather cuts down driving. However the gradual wearing out of tires is forcing a larger percentage of cars off the roads constantly, releasing more gasoline for military purposes. Total stocks show a decrease of 6,323,000 barrels as compared with a year ago, or a percentage of 7.3 below figures for January, 1943.

Stocks of crude oil also gained slightly, resulting in total accumulations 2.4 percent higher than a year ago.

Output of gasoil and distillate rose by 103,000 barrels daily, but total stocks dropped 1,624,000 barrels, leaving the total 5 percent lower than a year ago.

Tight Fuel Oil Market On Eastern Seaboard

At most Eastern Seaboard points, fuel-oil suppliers report shortages of products with a corresponding tight market. Demand exceeds available supplies generally and dealers predict "critical shortages ahead unless milder weather prevails." Notable shortages

Crude Oil Production in the United States

(Estimates compiled by The OIL WEEKLY. All figures indicate daily averages, in barrels.)

STATE OR DISTRICT	PRODUCTION IN WEEK ENDED January 29	January 22
Arkansas	78,400	79,700
California	815,650	*819,500
Long Beach	30,500	30,600
Midway-Sunset	55,900	55,900
Kettleman Hills	41,450	41,600
Wilmington	100,400	100,600
Rest of State	587,700	590,800
Colorado	7,500	7,800
Illinois	218,400	203,450
Salem	26,100	25,300
Louden	35,600	34,900
Other New Pools	144,600	131,250
Old Pools	12,100	12,000
Indiana	12,650	12,150
Kansas	286,700	281,050
Kentucky	22,450	23,550
Louisiana	358,500	358,300
North Louisiana	77,500	77,300
South Louisiana	281,000	281,000
Michigan	51,600	57,100
Mississippi	44,400	45,550
Missouri	90	90
Montana	25,698	24,329
Nebraska	1,400	1,500
New Mexico	113,000	113,100
New York	13,650	13,100
Ohio	9,000	9,600
Oklahoma	328,800	329,000
Oklahoma City	48,700	48,800
Seminole Area	71,600	72,250
Rest of State	208,500	208,750
Pennsylvania	40,200	37,350
Tennessee	30	30
Texas	1,899,625	1,900,475
Upper Gulf Coast	520,700	520,850
East Texas Field	366,050	366,100
Rest of Eastern Texas	116,350	116,500
Lower Gulf Coast	194,200	194,200
Southwest Texas	79,600	79,700
South Central Texas	19,900	19,925
West Texas	364,500	364,750
North Texas	140,325	140,450
Panhandle	98,000	98,000
Utah	12	10
West Virginia	8,450	9,100
Wyoming	90,600	87,800
Total United States	4,426,805	*4,414,434

* Revised.

Trends of Operations and Changes in Stocks

Figures on crude stocks are from Bureau of Mines weekly reports; all others from American Petroleum Institute weekly reports, which are estimates on Bureau of Mines basis.

(All figures in thousands of barrels—add 000)

HIGHS AND LOWS OF RECENT YEARS

ITEM	Crude Oil Prod. Barrels Daily	Week Ended	Runs to Stills Barrels Daily	Week Ended	Crude Stocks Barrels	Week Ended	Gasoline Stocks Barrels	Week Ended	Gasoil and Distillate Stocks Barrels	Week Ended	Residual Fuel Oil Stocks Barrels	Week Ended
Highs:												
1939	3,910	8- 5	3,650	10-21	278,607	5-26	87,769	4-22	39,562	10-28	116,237	8-26
1940	3,890	3-16	3,690	6-22	265,865	8-31	102,817	4-20	49,051	10-19	109,135	9-14
1941	4,337	11-22	4,120	10-18	266,187	3-29	99,727	3-29	[1]54,983	11-15	102,448	1- 4
1942	4,337	2- 7	3,961	1- 3	263,208	3-28	[1]109,281	3-14	49,861	11-14	95,857	1- 3
1943	[1]4,436	11-13	4,331	12- 4	245,752	5-29	94,159	3-20	46,187	11-27	72,881	1- 2
1944	4,389	1-22	[1]4,453	1- 1	240,992	1- 1	79,763	1-22	42,310	1- 1	57,330	1- 1
Lows:												
1939	[3]1,601	8-26	3,125	2-18	[2]229,127	10-12	71,152	10- 7	20,722	4-15	105,397	4- 8
1940	3,335	11-30	3,370	1- 6	237,339	1-27	79,847	11- 9	23,551	4- 6	102,344	2-10
1941	3,364	1-11	3,490	1-18	240,399	11-15	79,923	10- 4	28,381	4-12	90,914	7-12
1942	3,297	7- 4	3,393	5-23	231,896	12-12	75,934	12- 5	29,240	4-25	72,962	12-26
1943	3,821	1- 9	3,579	3-13	232,191	1- 9	68,182	10-16	30,732	4- 3	57,596	12-25
1944	4,357	1- 1	4,264	1- 8	238,148	1-15	76,302	1- 1	38,296	1-22	53,431	1-22

TRENDS OF 1942 AND 1943

Trends in Week Ended:	Crude Oil Production Daily	Runs to Stills Daily	Stocks Week End	Gasoline Production Weekly	Gasoline Stocks Week End	Gasoil and Distillate Production Weekly	Gasoil and Distillate Stocks Week End	Residual Fuel Production Weekly	Residual Fuel Stocks Week End
1942:									
January 3	4,038	3,961	244,440	13,797	92,987	3,855	49,357	6,918	95,857
January 31	3,871	3,848	250,740	13,292	97,810	3,817	40,674	6,640	91,189
February 28	4,016	3,675	259,373	12,131	105,635	3,799	34,547	6,813	88,285
March 28	3,820	3,667	263,208	11,663	105,624	3,661	31,756	6,344	83,045
April 25	3,581	3,506	257,073	10,535	102,897	3,267	29,240	6,869	81,107
May 30	3,877	3,522	255,023	10,478	95,355	3,034	31,384	6,993	79,628
June 27	3,719	3,581	253,364	10,713	88,396	3,549	32,851	6,615	77,304
July 25	3,691	3,658	249,262	10,864	82,281	3,647	35,966	6,796	77,816
August 29	3,964	3,697	249,007	11,300	80,831	3,850	42,060	6,875	78,034
September 26	3,909	3,802	242,785	10,954	80,550	4,215	45,954	7,094	78,943
October 31	3,901	3,731	239,266	11,153	79,159	.....	48,131	.....	79,166
November 28	3,878	3,736	234,850	11,269	78,854	.....	49,739	.....	77,796
1943:									
January 2	3,871	3,734	233,938	10,957	82,420	4,285	42,913	7,683	72,881
January 30	3,826	3,698	233,863	10,339	88,830	3,888	37,057	7,452	70,763
February 27	3,873	3,709	235,217	10,566	93,157	4,230	32,939	7,839	70,140
March 27	3,896	3,742	239,126	10,231	94,079	3,541	30,980	8,018	67,938
April 24	3,913	3,737	242,035	10,583	91,001	3,954	31,142	8,168	67,455
May 29	3,970	4,679	245,752	10,656	83,937	3,798	32,274	7,672	67,682
June 26	3,955	4,015	242,657	11,092	79,589	3,876	34,044	8,126	67,960
July 31	4,133	3,788	238,420	11,127	74,977	3,765	36,363	8,478	66,877
August 28	4,196	4,227	236,170	12,420	72,525	4,351	37,928	8,732	67,250
September 25	3,344	4,156	233,013	12,206	70,024	4,608	40,328	8,560	66,659
October 30	4,383	4,176	237,219	12,813	69,297	4,642	44,591	7,968	63,838
November 27	4,414	4,261	239,761	12,638	69,980	4,379	46,187	8,633	62,143
December 25	4,363	4,185	241,310	12,597	74,024	4,457	43,791	8,689	57,596
1944:									
January 1	4,357	[1]4,453	240,992	13,192	76,302	4,575	42,310	9,141	57,330
January 8	4,365	4,221	238,114	12,630	77,654	4,434	41,509	9,061	55,731
January 15	4,373	4,203	238,148	12,682	*78,557	4,231	*39,920	8,459	*54,327
January 22, 1944	**4,389**	**4,368**	.....	**12,943**	**79,763**	**4,334**	**38,296**	**9,041**	**53,431**
January 23, 1943	3,849	3,555	[4]232,647	9,930	86,086	3,814	40,303	7,290	71,689
Change:									
In week	+16	+165	+34	+315	+1,206	+103	—1,624	+582	—896
In year	+540	+813	+5,501	+3,013	—6,323	+520	—2,007	+1,751	—18,258
In year	+14.0%	+22.9%	+2.4%	+30.3%	—7.3%	+13.6%	—5.0%	+24.0%	—25.5%

[1] All time peak. [2] Lowest since April, 1922. [3] Lowest since October, 1922, due to shutdown of six Mid-Continent States. [4] Stocks January 16, 1943. * Revised.

already exist in kerosine and bunker C oil.

In the Chicago territory the continued strong demand for gasoline has dealers puzzled and they believe that the black market must be responsible. In some sections of the Middle West, mild weather has permitted farmers to get at their work about a month earlier than usual, thereby creating an out-of-season demand for tractor fuel.

The transportation problem grows worse in the farming districts, and several Mid-Continent refiners report an acute situation with transport trucks.

The market for refined products in the Gulf Coast district was reported quiet. Local business comprised the bulk of activity, and some refiners say they are completely inactive. Those able to arrange transportation report no change in the volume of products shipped.

Fluid Cracking Plant in Operation at Wood River

Production of aviation gasoline will be quadrupled at the Wood River, Illinois, refinery of Shell Oil Company by construction of several additional refining facilities. One of these, the Mid-West's first fluid catalytic cracking plant, was completed recently, and output of 100-octane gasoline with the new unit will begin immediately.

The second step in 1944 expansion at Wood River will be the completion in a few weeks of another fluid cracking plant, a twin to the one just put into operation.

WHITNEY
NATIONAL BANK
OF NEW ORLEANS

Established 1883

Statement of Condition

At the Close of Business, Friday, December 31, 1943

RESOURCES

Cash and Due from Banks	$ 80,419,342.55
U. S. Government Obligations, Direct and Fully Guaranteed	118,790,729.50
State, County and Other Public Bonds	12,653,624.69
Other Bonds and Securities	907,421.50
Loans, Discounts and Acceptances	50,041,203.78
Customers' Liability Account of Acceptances and Letters of Credit	565,848.23
Stock of Federal Reserve Bank	300,000.00
Accrued Income Receivable and Prepaid Expenses	627,332.84
Banking House, Furniture and Fixtures	3,043,444.67
Branch Banking Houses	754,414.43
Other Real Estate	316,588.03
TOTAL	$268,419,950.22

LIABILITIES

Deposits		$254,645,137.84
Acceptances Account of Customers and Letters of Credit		735,215.09
Dividend Declared, Payable January 3, 1944		84,000.00
Accrued Interest, Expenses and Reserves		512,570.43
Capital	$2,800,000.00	
Surplus	7,200,000.00	
Undivided Profits	2,275,026.86	
Reserve for Dividend not Declared	168,000.00	12,443,026.86
TOTAL		$268,419,950.22

DEPOSITARY OF THE UNITED STATES GOVERNMENT, STATE OF LOUISIANA AND CITY OF NEW ORLEANS

MEMBER OF THE FEDERAL DEPOSIT INSURANCE CORPORATION

Gain in Illinois Boosts Week's Oil Output

Taking an upward turn, production of crude oil in the United States rose to a total of 4,426,805 barrels during the week ended January 29, an increase of 12,371 barrels over last week's total of 4,414,434 barrels.

Largely responsible for the increase was Illinois which reported production of 218,400 barrels, a climb of 14,950 barrels over last week's total of 203,450 barrels. Also reporting increases were Kansas, Wyoming, Montana, and the Eastern States.

California's production declined 3850 barrels from its spectacular jump last week to an all-time high of 819,500 barrels. Michigan slipped 5500 barrels, and Texas' output remained approximately the same.

First Products Pumped Into New 20-Inch Line

B. E. Hull, general manager of War Emergency Pipelines, Inc., announced January 26 that the first petroleum products was pumped into the 20-inch products line from Beaumont, Texas, northward.

In order to make proper tests of the line, a quantity of gasoline is being pumped ahead to clear up all water that might cling inside the line preparatory to running large quantities of heating oils. Gasoline is being pumped into the line at the rate of 5000 barrels hourly.

Salt Water Company Names New Directors

Thirty salt water disposal systems in operation in the East Texas field were injecting more than 200,000 barrels of water daily with approximately 70 percent of the water produced being returned to the reservoir, it was disclosed at the annual reports of the East Texas Salt Water Disposal Company which held its annual meeting in Dallas recently. More than 128,000,000 barrels of oil (daily average of 352,351 barrels) were produced during 1943 with a pressure drop of only 3.27 pounds or twice the oil per pound pressure loss than during any other period in the life of the field.

Bryan W. Payne of the Iowa-Payne Oil Company, Tyler, was re-elected president of the company; W. S. Morris was re-elected vice president and general manager; J. H. Moyar, with Stanolind Oil & Gas Company, Fort Worth, was re-elected secretary-treasurer, and Roy R. Merrill was re-elected assistant secretary-treasurer.

Directors elected were: E. H. Blum, The Atlantic Refining Company; David Frame, Humble Oil & Refining Company; J. H. Moyar, Stanolind Oil & Gas Company; Bryan W. Payne, Iowa-Payne Oil Company; John G. Pew, Sun Oil Company; Joe Zeppa, Delta Drilling Company; M. Albertson, Shell Oil Company; Bert Fields; J. J. Frommer, The Ohio Oil Company; Don R. Gladney, Magnolia Petroleum Company; Jake L. Hamon, Cox & Hamon; C. W. Hughes, Arkansas Fuel Oil Company; L. G. Hughes, The Texas Company; J. W. Jordan, Sinclair Prairie Oil Company; F. A. Lawrence, Cities Service Oil Company; O. G. Leichliter, Mudge Oil Company; C. V. Millikan, Amerada Petroleum Corporation; Geo. L. Nye, Tide Water Associated Oil Company; C. P. Porter, Blackwell Oil and Gas Company; Ralph B. Shank, Hunt Oil Company, and C. R. Starnes.

For They Shall Inherit

Some day peace must fall on a world in which Democracy is triumphant. What can victors take who desire no spoils? What can the vanquished offer but rubble, ruins and despair?

The soft cloak of peace will not, and should not, hide these broken lives. From the endless rubble, man must recreate that promised land of freedom and opportunity for which he fights. In this rebuilding world our American doctrine of Individual Initiative and Free Enterprise—which made this country great—can give back to the humble the chance to earn their inheritance.

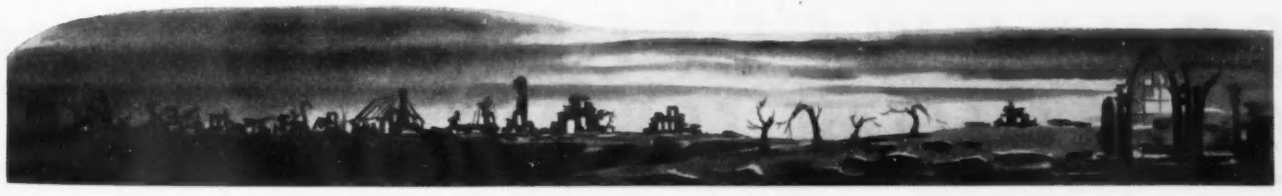
It is to protect these priceless heritages that the Gulf South, and all America, now strives with such might for Victory.

THE *Gulf South*

ITS RESOURCES, ITS MANPOWER, ITS PRODUCTION ARE DEDICATED TO VICTORY

★ ★ ★

UNITED GAS PIPE LINE COMPANY: A Natural Gas transmission company dedicated to serve wartime fuel requirements throughout the Gulf South. FOR TEXAS - Mail received at Beaumont, Dallas, Fort Worth, Houston, Longview, San Antonio and Wichita Falls. For Louisiana - Mail received at Baton Rouge, Lake Charles, Monroe, New Orleans and Shreveport. For Mississippi, Alabama and Florida - Mail received at Jackson, Mississippi.



International Developments

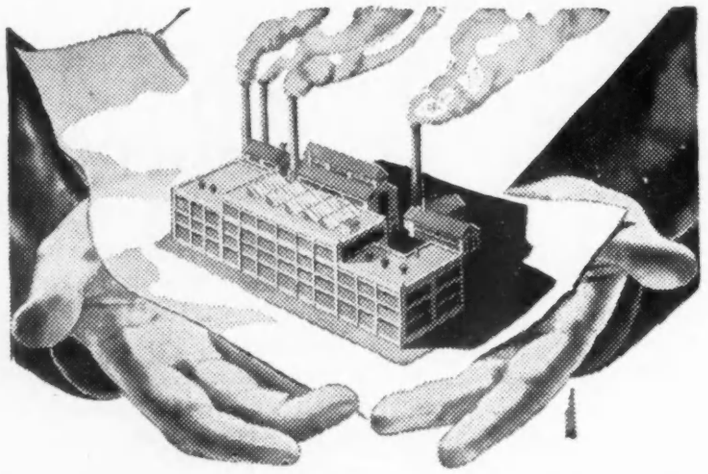
Hungary Oil Production Reported by Swiss Press

The Swiss press reports that oil production in Hungary increased from 318,000 barrels in 1938 to approximately 11,000,000 barrels in 1942, and that a number of successful wells have been drilled there since that time. One company, supervised by the Hungarian Ministry of Industry, is said to have produced 7,000,000 barrels during 1942. It was previously known that 8 wells in the new field discovered in 1937, near Janoshalma, were producing 1400 barrels daily (total) in 1938. This field, to the east of the Danube River, near the Yugoslavian frontier, has been fairly well drilled up in the meantime. This field gave Hungary its first commercial oil production. The oil recovered there is described as "better than 36 gravity." A second field was also discovered in the same country in 1937, near Bukkszek, in the northern area.

Refineries were in operation in both areas before the war began, and 45,000,000 pengo were reportedlv spent in field and refinery expansion during 1942 by Magyar-Amerikal Nyeralaz R. T. (the prewar Hungarian-American Oil Company).

OUR POWER IS

in your hands



The vast electrical energy of Southwestern Gas and Electric Company is available to the oil industry in every phase of operation. This service was neither interrupted nor curtailed when extremely heavy demands were made upon it by the war.

SIMPLE INSTALLATIONS
ECONOMIC OPERATION
CONSTANT, EVEN POWER

Southwestern Gas and Electric Company was ready when the war came suddenly upon the industry — it will be ready for post-war demands.

SOUTHWESTERN
GAS & ELECTRIC COMPANY

Development Is Planned In Moose River Basin

Further development of the oil-shale deposits in the Moose River basin of northern Ontario, and the drilling of a number of wells in an effort to find production in the same area, are definitely planned for 1944, through the activities of the newly-formed Big Five prospecting Syndicate, headed by Albert Hartley, of Calgary, Alberta. The group has already applied for drilling permits to put down exploratory holes in Hecla and Rapley townships. Mining Research Corporation, consulting engineers, has recommended the area as favorable territory for drilling prospects.

The oil-bearing shales outcrop about 50 miles above the mouth of the Moose River, which empties into James Bay, the southeastward extension of Hudson Bay. The shales are of Devonian age and are associated with sandstone beds that have good reservoir characteristics over a large area of regional and local closure. Rocks of Silurian age are present below the Devonian section, and form the bedrock surface south and west of the Moose River basin.

Bulgaria Is Attempting Shale Oil Production

The minister of commerce of Bulgaria has issued claims that successful experiments have been concluded in that country on the recovery of oil from shales. Negotiations are in progress, according to the Bulgarian press, to secure from other nations specially-designed equipment for establishing a national shale-oil industry.

Vermilion Most Active, Turner Valley Second

The Alberta Petroleum Association reports that the 35 wells completed in the Vermilion field in 1943 made that area the most active in the Dominion in that period. Turner Valley was second, with 25 completions; and 80 wells were put down in the province as a whole, for the greatest footage in the history of Alberta. Most of the drilling in the Vermilion field was done by Cannar Oils, Limited, Canadian National Railways subsidiary. On January 1, this company had 15 producers in the field, 4 more successful completions, 6 wells standing cemented, and 2 dry holes.

New Gas Field Opened in Pinhorn Area, Alberta

McColl-Frontenac Oil Company's test in the Pinhorn area, Alberta, has resumed drilling after penetrating a 25-foot gas-sand at 2970-2995 feet. On a 1 hour and 40 minute test of this pay, a gas flow of approximately 5,000,000 cubic feet per day was gauged, with bottom-hole pressure of 1300 pounds. The amount of distillate in the gas is regarded as too small for commercial recovery. The hole will be carried down for a test of the Madison limestone section, with top expected at 3300-3350 feet. The operator announces that several more potential pays above the Madison will be carefully checked on the way down.

U. S. Field Operations

Illinois

New Pool Opened Near Mill Shoals Field

Robinson and Puckett have opened a new pool at Felix heirs 1, SE NE SE 12-3s-7e, 1½ miles north of Mill Shoals pool production in Wayne County. During a one-hour drill-stem test of Aux Vases sand at 3240-52 feet, the well made 850 feet of oil, 150 feet of oil-cut mud and no water. Pipe was set at 3240 feet for test.

Madison County: Obering and Associates are preparing to deepen Becker-Pence 1, SE NE SE 9-4n-6w, the northernmost well in the Marine pool, which brightened the potential picture of the area by flowing 435 barrels of oil natural and no water from Devonian lime at 1688-93 feet. Operators believe additional pay can be tapped by deepening.

Jefferson County: The first Aux Vases sand producer of Markham City north field has been completed. It is Central Pipe Line Company's Henry 2, SE NE SE 13-2s-4e. Well pumped initially 170 barrels of oil and 20 barrels of water in 24 hours from pay at 2943-55 feet. Henry 1, the Aux Vases discovery in the previous McClosky producing pool was completed in the lime and operators drilled the Henry 2 for Aux Vases testing.

Wayne County: Pure Oil Company has completed Van Fossan 2, SW SW 14-1n-8e, as one of the best producers in the state in several weeks. The well produced 1200 barrels of oil daily from McClosky lime with total depth 3120 feet. The company also completed Brown Consolidated 1, NE NW 23-1n-8e, for 400 barrels daily from McClosky lime at 3055-63 feet.

White County: Gulf Refining Company is drilling ahead at its wildcat Garfield-Parsons 1, SW SW SW 7-4s-14w, east of Crossville, after finding oil shows in the Biehl sand at 1221 feet and the Clore at 2004 feet. The test is slated for McClosky lime.

Great Lakes Carbon Company's Miller 2, near the Manie pool in 28-6s-10e, flowed nearly 800 barrels natural from Tar Springs sand at 2250 feet, for one of the state's most important developments last week. The well was deepened 30 feet after the pay was found.

Bond County: B. F. Thompson has completed Fallett 2, SW NW 31-4n-2e, in the Beaver Creek pool, for 40 barrels of oil and five barrels of water in 24 hours at 1122 feet in Benoist sand.

Indiana

Failures Discount Posey County Strike

The new area opened by Sells Petroleum Company and associates' Wade 1, SE SW NE 14-5s-14w, 1½ miles southeast of the South New Harmony pool, Posey County, was handed a severe blow when two offset tests were abandoned as dry.

Sinclair Oil Company's south offset and Mohawk Drilling Company's offset, two locations north, each found the Hardinsburg sand and other horizons dry. The discovery well pumped 300 barrels of oil and 15 barrels of water from Hardinsburg in 24 hours from pay topped at 2454 feet.

Kentucky

Utley Pool Extension Makes Good Oil Flow

Miller & Schiarella's northwest extension of the Utley pool in Union County, Moore 1, 16-P-21, was one of the best bets of the week in Kentucky.

The well flowed 215 barrels of oil in four hours from McClosky lime through ¾-inch choke on 2-inch tubing after 4000 gallons of acid. Pay was encountered at 2546-76 feet. The well has been carried as Basin Drilling Company's Moore 1.

Kansas

Two Discovery Wells but Activity Generally Slow

A new field is assured at The Atlantic Refining Company's Neil 1, NW NW NE 27-24-14w, which last week showed free oil through drill stem. On a test after casing had been run and set in Arbuckle lime at 4230 feet, the well made 3700 feet of oil into the hole in 7 hours. The lime had been drilled to 4244 feet before this fillup was made, and test is continuing.

Barber County: Deep Rock Oil Corporation's Skinner 1, CW½ NW SE 29-31-14, southwest of Sun City production, is a discovery well after a prior test ½ mile north failed to show for the commercial production initially anticipated when Viola lime was first tested. Acid treatment of the original test on the acreage failed to gain the response expected and the operator made another location to the south of the first test as Skinner 1. Viola lime was topped in this well at 4624 feet and drilled to 4640 feet. Acid treatment was made with 7000 gallons and while no production test has yet been made, the well made a total of 119 barrels into tanks while tubing and rods were being run. On prior tests the well swabbed and flowed amounts ranging from 25 to 90 barrels.

Pratt County: Cities Service Oil Company is completing a good northeast diagonal offset to production in the Chitwood area at Rosenbaum 1, SWc SE 14-28-12w. The well found Simpson sand at 4379 feet and perforated casing from 4387 to 4397 feet with 34 holes. In one hour the well began heading and made a short flow. Tankage is being erected.

Rice County: A minor extension to the northern edge of Silica field may be in the making at Nadel & Gussman et al's Bayer 1, NEc SW 29-19-10w. Conglomerate was tested between 3273 and 3281 feet after Arbuckle lime failed to show commercially. On short incomplete test the upper formation put 2000 feet of oil into the hole in 10 hours. Equipment is being installed for testing.

Oklahoma

New Field Is Located East of Pauls Valley

Ramsey Petroleum Company has opened a new field in Pennsylvanian sediments in Southern Oklahoma at a spot only a little less than 4 miles east of Pauls Valley in Garvin County, with McDowell 1, C NE SE 13-3-1e, which is incomplete at 2985 feet. The well topped the saturation at 2959 feet and ran casing through the section. This was then perforated with 20 shots between 2962 and 2967 feet, and again with 20 shots between 2979 and 2984 feet. Another general perforation was made between 2960 and 2984 feet, this time with 160 shots. A drill-stem test was inconclusive and on swab the well made 3 barrels of oil hourly without showing any water. The oil has been tested at 35.2 gravity.

Carter County: An unusually good well is in process of completion in the old Tussy field at Allied Materials' Gray 1, NE SE SE 9-1s-3w. Tussy sand was drilled at 2641 feet and casing was perforated in saturation at 2650 to 2692½ feet. On initial test the well flowed 720 barrels of oil and no water in 24 hours through ⅝-inch choke. Tubing is being run. This show in this area of old development could easily result in a local redrilling campaign if it becomes evident the sand section producing in this location is not isolated from the field by faults.

Pottawatomie County: Indications of probable commercial production has been had at The Atlantic Refining Company's Orr 3, SE SE SE 13-11-4e, which has cored Wilcox sand to find it stained and saturated in streaks. Top of the stratum was at 4729 feet and a core was taken between 4732 and 4752 feet. Last reported core was above 4767 feet, and additional shows were encountered in this section.

McClain County: Carter Oil Company's Cottingham 1, C SE SW 4-7n-3w, on a deep seismographic structure, is drilling in hard sand at 10,754 feet. The sand is tentatively identified as Wilcox, the first part of which showed staining on initial coring of the section.

Carter Oil Company's Johnson Ranch 1, C SW NE 13-8n-4w, a location on another deep seated structure, is fishing for twisted drill pipe with hole bottomed at 9891 feet in Sylvan shale. Some good shows of oil were reported.

Cleveland County: Mid-Continent Petroleum Corporation's Tubbs 1, the deepest of two wells drilling as offsets to the company's West Moore discovery, is now nearing critical depth at 6870 feet.

Freestone County Gas Area Gets Line Outlet

Lone Star Gas Company is providing a pipe-line outlet for the Stewards Mill gas pool, Freestone County, by constructing a 14½-mile 6-inch welded line to tie into its East Texas system near Wortham. Sharman & Allen have the contract and are scheduled to have the unit in service by mid-February.

West Texas

Favorable Returns Show In Permian Basin Tests

Prospecting in the Permian Basin is beginning to show favorable returns with Pecos and Andrews Counties contributing new oil areas, while the latter also has promise of a deep strike. Hockley County has a firm bid for an oil discovery on the south flank of the Matador uplift.

Pecos County: Standard Oil Company of Texas, Mac-Der Company 1, C NE NW T. & St. L. Ry. 36, block 144, opened a new oil area with an abundance of high-pressure gas in the Ellenburger, topped at 4706 feet with an elevation of 2643 feet, and pipe has been cemented at 4727 feet to complete. This wildcat was given drill-stem test at 4706-30 feet, resulting in gas flow rated at 3 to 5 million feet within 3 minutes. Tool was closed at the end of 8 minutes for fear of well getting out of control, and drill pipe yielded 200 feet of oil and 30 feet of rotary mud. It is on a 1920-acre site, and is 6½ miles south of Oswego pool, recent oil discovery in 4000-foot Ellenburger.

Hockley County: Stanolind Oil & Gas Company's Cobb 1, SEC Labor 103-E, League 75, Haskell County school lands, and in the northwest portion of county, registered adequate oil saturation and porosity with formation bleeding oil when cores were pulled at 4639-69 feet to warrant landing pipe for production test. This wildcat entered Brown lime at 3310 and San Andres at 3610 feet with elevation of 3570 feet, being slightly higher than Brown & Wheeler, Inc's., French 1, recent 6511-foot Clear Fork failure situated 3-1/3 miles south by west. However, Cobb 1 is nearer the apex of the matador uplift, involving buried granite mountains extending east-west across the basin.

Reagan County: Superior Oil Company-Wiggins and Hyde's University 1-A, 2½ miles northwest of the Grayson pool, was showing small amount of oil with acid water and residue after two-stage treatment with 4000 gallons of acid at 3175 feet.

Winkler County: Magnolia Petroleum Company's Walton-State 21, ¾-mile southeast of its Kermit-Ellenburger discovery, was running pipe to complete at 10,680 feet after flowing at rate of 67 barrels of 42.6-gravity oil with gas-oil ratio of 1728/1 when tester was used at 10,625-10,655 feet in Ellenburger, topped at 10,581 feet. It is near the water level established by the discovery.

Andrews County: Humble Oil & Refining Company's Carter 1, C SE SW PSL 23, Block A-46, Deep Rock area, entered its first bid for deep production when drill-stem test at 10,235-10,260 feet returned oil- and gas-cut water blanket and rotary fluid. A second drill-stem test at 10,276 feet in dry lime failed, and another core will be pulled. The horizon has not been definitely identified, while the top of the Silurian has been tentatively called at 10,165 feet with elevation of 3195 feet. Signal Oil & Gas Company's Fisher 1, C SW SW PSL 25, Block A-35, 3 miles west by south of the south end of the Means field, marks the entry of a new pool in yielding 3 to 4 barrels oil hourly on swabbing test after using 5500 gallons of acid at 4593-4628 feet in San Andres, topped at 4593 feet with elevation of 3226 feet.

Hale County: Amerada Petroleum Corporation's Kurfees 1, 10 miles southeast of Plainview, was due to continue perforating higher after yielding water from perforations at 9870-9922, 9770-9840 and 9670-9760 feet. This wildcat logged base of Mississippian at 10,093 feet and quit in black granite at 10,250 feet.

Deep Projects: Lion Oil Refining Company has contracted to drill an 11,000-foot (or Ellenburger) test on its Grisham-Hunter 160-acre lease in PSL 45, Block 26, near the center of the Hendrick field, Winkler County. This highly-productive reef-type structure has not been explored below 4556 feet.

In Crane County, James Fitzgerald, Jr., I. T. Dennis and Eastland Oil Company are starting McPherson 1, C N¼ of N¼ H&TC Ry. 16, Block 35, with the Ellenburger as the objective. It is on a strike between Ordovician failures that recorded structural relief and a small amount of production.

Northwestern Kent County has been assigned a 7400-foot test by Blackwell Oil & Gas Company, which will drill on the House ranch, PSL 8, Block B, 4 miles northeast of a Garza County test that drilled to granite, then developed a small amount of oil from Pennsylvanian after plugging back.

Delaware Basin: Standard Oil Company of Texas is following up its extensive lease purchases in Loving, Reeves and Culberson Counties the past two years in authorizing two more Delaware projects. The company's Culberson County test is listed under wildcat locations, while its Loving County project will be on the W. D. Johnson ranch, T&P 26, Block 54, 4½ miles northeast of the Wheat field. The company operates a pipe line from Winkler County across the Delaware Basin to its El Paso refinery.

Trans-Tex Holdings Bought By The Texas Company

The Texas Company has announced purchase of properties owned by Trans-Tex Petroleum Company, in Illinois, Indiana, and Kentucky. Leases included consist of 11 in Illinois, seven in Smith's Mill Field of Kentucky, and two in Indiana.

Interstate Pipe Line Company, an affiliate of Trans-Tex Petroleum Company, was also included in the deal.

D. C. Bintliff, Houston, Texas, is president of the Trans-Tex organization.

Los Angeles Nomads Name Officers for the Year

Officers and regents for the coming year were elected January 12 by the Los Angeles Chapter of Nomads as follows: Roland E. Smith, president; Wallace A. Sawdon, vice president; J. C. Ballagh, secretary; Elmer R. Smith, treasurer; William McGraw, sergeant-at-arms; John Dodge, assistant secretary; Fred Tyler, assistant treasurer; T. M. Johnston, deputy sergeant-at-arms; W. F. Bettis and Henry W. Pullman, regents.

The fifth Annual Inaugural Ball in honor of the incoming and outgoing officers will be held February 5.

Palo Pinto County Well Flows 35 Barrels Daily

Discovery of oil near Conway gas pool opened in Palo Pinto County last year is indicated by W. K. Gordon et al's Conway 5, SW T&P 50, Block 2, with the flow rated at 35 barrels daily. The well originally tested 3,750,000 feet of gas daily at 3568-76 feet, and sprayed oil after being shut in 3 days. In the northwest part of Palo Pinto County, A. J. Rife et al's Belding 1, C NW SW AB&M 1, Block A-10, entered Marble Falls at 3714 feet, and logged oil saturation in sand at 3982-99 feet and in lime at 4403-07 feet, where a test is pending.

Jones County: Great Lakes Carbon Corporation's Nance 1, east offset to its Hardy pool Canyon lime oil discovery, proved dry in the Canyon series and abandoned at 3750 feet. Two outposts to the southeast and northwest also missed the pay and were plugged.

North Texas

Two Strawn Oil Strikes Reported in Cooke County

Eastern Cooke County recorded two wildcat oil strikes from the Strawn series, and Haskell County has a prospective discovery from Palo Pinto lime. Several North Texas recent discoveries have confirmation wells in process of completion.

A prolific discovery is indicated for the Cosefield prospect, Northeastern Cooke County, through Sinclair Prairie Oil Company's Winnie Montgomery 1, Robert Finley Survey, having yielded 4550 feet of 40.5-gravity oil when tester was used at 5114-22 feet. Bottom-hole pressure was calculated at 2450 pounds. After this test a core pulled at 5122-37 feet returned 9 feet of oil sand and 6 feet of shale and the prospect is due to be carried to Ellenburger before running pipe for completion. Montgomery 1 drilled into Strawn oil sand at 5112 feet with elevation of 758 feet, and the well threatened to clean itself at 5122 feet when testing tool opened before reaching bottom on first try. This pending discovery is 1-2/3 miles northwest of nearest production in the Walnut Bend multi-pay field, but separated by three direct and indirect Ellenburger failures. The Texas Company will drill a northwest offset on its 120-acre lease, and Magnolia Petroleum Company has acreage to the north and west.

Northern Ordnance, Inc., attained its first discovery in the district when Foy Davis 1, D. de los Santos Survey A-894, 1¼ miles northeast of Woodbine and near the center of the east line of Cooke County, yielded 650 feet of oil and no water when tester was used at 4340-55 feet. Five-inch pipe has been set for completion. This strike is 2⅝ miles southeast of the Burk-Osborn one-well shallow pool, and ⅞-mile northwest of Denver Producing & Refining Company's Allred 1, which entered Ellenburger at 4758 feet and abandoned at 5124 feet. Northern Ordnance acquired the drilling block from Seitz-Comegys & Seitz, carrying the latter for ⅛-overriding royalty interest.

Haskell County: Hunter & Hunter and Sohio Petroleum Company's J. D. Hughes 1, M. Travieso Survey, entered

Palo Pinto lime at 3278 feet and logged broken oil saturation in coring to 3290 feet, where a drill-stem test was pending. This wildcat showed considerable structural relief as the partnership's Wood 1, L. Dyches Survey 46, 8500 feet northwest, entered Palo Pinto at 3407 feet and quit in salt water at 3482 feet.

Confirmations: Kerlyn Oil Company and Phillips Petroleum Company's Holt 1, S. Sallie Survey and 1000 feet northeast of British-American Oil Company's small Mississippian well, flowed 52 barrels in 3 hours through 14/64-inch then tested 66 barrels in ½-hour through 26/64-inch after using acid at 5216-20 feet in Mississipian, topped at 5158 feet, or 23 feet high. Phillips Petroleum Company et al's Danglemayer 2, 800 feet northwest of the Dangle pool discovery in Southwestern Cooke County, filled 400 feet with oil in 12 hours and was to be acidized to try for flowing production, which is from Ellenburger saturation at 2308-15 feet, being 143 feet low. In Montague County, Continental Oil Company's Hogue 1, situated 800 feet southeast of its Spencer pool discovery, recovered 10 feet of oil sand and 5 feet of shale in recovering core at 2777-93 feet, and set pipe at 2714 feet to include gas zone. In Wise County, Stanolind Oil & Gas Company's Lewis 1, C SW SW Falls CSL Section 8, Park Springs area, logged oil saturation at 5596-5615 feet in Bend, topped at 5585 feet, 27 feet high to nearby failure, and was awaiting drill-stem test. The company's Menasco 1, located 1¼ miles northeast, was plugged after pumping a few months from Bend.

Montague County: S. D. Johnson and Alco Valve Company's Howard 1, wildcat in Guadalupe College Survey, showed oil odor and stain in top of Viola at 6284-6340 feet and a show of gas in top of Simpson at 6543-55 feet. Nominal shows were passed up in Bend, topped at 5878 feet. The test was drilling dry lime at 6620 feet.

The Hildreth field continues to bolster its outlook for being the most active drilling center in the district this year. Continental Oil Company made final production tests of Hamilton 1 and Coffield 1, both outposts that are listed under current completions, while the company's Roye 1, northeast outpost, flowed oil through tester from Bend at 6162-6210 feet. C. H. Murdick et al's Walthall 1, 2700-foot west outpost, is apparently safely within the production contour through having entered Bend at 6060 feet, and was making drill-stem test at 6076 feet.

East Texas

More Activity Seen Near Smith County Discovery

Two more operations have been assigned the Sand Flats prospect, Smith County, where the pending discovery is preparing to perforate opposite the upper Rodessa after flowing small volume of 37-gravity black oil with acid residue by heads. This strike involves Skelly Oil Company's Chisum 1, which has released the rig for starting a 1500-foot east offset. Acid treatment through perforations at 9265-9307 feet in lower Rodessa revealed subnormal porosity and permeability of the formation. The best production possibility involves the Paluxy sand at 6944-7012 feet. Humble Oil & Refining Company is joining the development with the starting of Emma Shamburger 1, situated 3650 feet south by east of Chisum 1.

Arkansas Fuel Oil Company's Marsh 1, ½-mile southeast outpost, entered Fort Worth lime at 6351 feet, and was drilling at 6560 feet. Sun Oil Company's Patterson 1, seeking a 3800-foot west by south extension, was coring without shows at 7273 feet in Paluxy, topped at 7170 feet with elevation of 509 feet, being 147 feet low.

Smackover Tests: Barnsdall Oil Company's Heilborn 1, M. H. Jones Survey, was awaiting orders at 7836 feet in Smackover, topped at 7690 feet with elevation of 285 feet. Electrical log indicated possible oil or gas at 7706-22 feet followed by water.

In Morris County, Humble Oil & Refining Company's Wright 1, Samuel Story Survey, entered Smackover at 11,488 feet with elevation of 338 feet, and was coring at 11,730 feet. Porous zone, possibly water, was logged at 11,509 to 11,607 feet.

In Hunt County, Humble Oil & Refining Company's Norman 1 was coring red shale at 6910 feet, and is credited with having entered the Smackover.

A. G. Hill et al's Anderson-Magnolia 1, Robertson County's first Pre-Trinity test, was drilling shale with streaks of sand at 9060 feet in Cotton Valley, topped at 8700 feet.

Wood County: Magnolia Petroleum Company's Lindley 1, Yantis prospect

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Banking House		1,887,000.00
Furniture and Fixtures		271,184.44
Stock in Federal Reserve Bank		300,000.00
U. S. Government Securities		64,845,976.34
State, Municipal and Other Securities		1,232,894.99
Cash in Vault and with Banks		55,776,782.37
Total		$184,311,964.53

LIABILITIES

Capital	$ 5,000,000.00	
Surplus	5,000,000.00	
Undivided Profits	1,051,000.00	$ 11,051,000.00
Reserve for Taxes, etc.		822,819.39
DEPOSITS:		
Individual	$94,497,534.01	
Banks	58,919,737.90	
U. S. Government	19,020,873.23	172,438,145.14
Total		$184,311,964.53

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with Travis Peak objective, eliminated the Paluxy in logging salt water in section at 6215-65 feet. Gulf Oil Corporation's Brewer 1, Winnsboro area, was drilling dry Glen Rose 8420 feet with last shows at 8001-10 feet. Shell Oil Company's Whatley 1, on the southeast edge of the Manziel field, was awaiting orders in sandy shale at 9005 feet, but probably will set pipe to test a high-gravity oil show at 8760-68 feet. Sun Oil Company's Scoggins 2, southwest outpost, entered Georgetown at 5077 feet, or 26 feet low, and was drilling at 5417 feet.

In the Quitman field, Amerada Petroleum Corporation et al's White 1-A, 380 feet northwest of a failure on the same unit, remained on the upthrow side of the fault and flowed 104 barrels of oil in 6 hours through ½-inch choke from 22 feet of oil sand in Paluxy at 6320-54 feet. Shell Oil Company's Goldsmith 8, also situated close to projected fault plane, logged 36 feet of oil sand at 6319-57 feet, then flowed 22 barrels hourly through ½-inch.

New Wildcats: Mid-Continent Petroleum Corporation was moving in rig to drill L. W. McGahee 1 in the northwest corner of a 61½-acre pooled tract, Harrison CSL Survey 2, A-54, 4 miles northwest of Pittsburg, Camp County. This area has been rated as a hot spot for months, and this test will be carried to Travis Peak. Sohio Petroleum Company's Little Sandy Club 1, in the southwest part of James Hamblin Survey, Wood County, 2¼ miles southeast of Crow, will drill to Paluxy. It is a mile northeast of the company's Wright 1, Smith County wildcat that was abandoned in Paluxy at 7105-7350 feet. In Rusk County, Sinclair-Prairie Oil Company's F. H. Markey 1, located 2231 feet from north and 1300 feet from east lines of Robert Merritt Survey, 6 miles west by south of Tatum, will drill to the Travis Peak.

Panola County: Continental Oil Company has set casing preparing to test oil shows in the Cotton Valley formation at Burnett 1, Cheairs survey, northeast of Carthage, after drilling to 9306 feet. The well also has shown for gas-distillate production in the Travis Peak and Pettit zones. It is two miles south of Rogers Lacy's Burnett 1, Hendricks survey, which was completed as a wet gasser.

Lacy's west outpost to the gas producer, Cameron 1, LaGrone survey, was below 5230 feet, and his Burnett 4, Hendricks survey, was below 2000. Location has been made for Feazel and Kinsey's Ross 1, Moorman survey, 2 miles west of their Jordan 1, field extension.

Marion County: Arkansas Louisiana Gas Company is preparing to deepen to Travis Peak for exploration its Walker 1, Humphries survey, which was completed several years ago as a gas-distillate producer in the Hill section of the Rodessa series. The well will be drilled to the 7300-foot level. Bradford and Scivally's Meyers 1, west of Jefferson, in the Miles Reed survey, was drilling below 5000.

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Southwest Texas

Wildcat Program Active In Rio Grande Valley

Indication that the Wilcox may prove productive in Victoria County is seen as Northern Ordnance Company sets casing to test its wildcat Heath 1 on a 177-acre tract in Eban Haven Survey, 1 mile north of Mission Valley. After drilling to 10,000 feet casing was set at 9950 feet. The well blew out from the Yegua section around 4500 feet, and logged streaks of sand at 5095-5140 feet that had oil odor, sand with gas odor at 8404-30 feet and sands showing oil and gas at 8430-35 feet. When electrical survey was run, a sand showed considerable "kick" in a section at 9855-95 feet. The area is comparatively new from a deep drilling viewpoint.

In the same area but in Jackson County, Amerada Petroleum Corporation is testing deeper sands in Graves 2 at North LaWard. The hole is bottomed at 8010 feet, and a series of tests will be made of the deeper horizons. The 5200-foot Marginulina sand section failed to show oil.

The lower Rio Grande Valley is seeing a widespread wildcatting program. Sun Oil Company will drill an 8100-foot test one mile southeast of production at Willamar in Willacy County, its Juan C. de Cavazos 1 on an 824-acre lease in share 8, San Juan de Carricitos grant. This field has developed into a major oil reserve since extensions have been made on both the south and north sides.

A deep wildcat is scheduled for the Linn area of northern Hidalgo County where Baldridge & King & Nichols and Sohio Petroleum Company will drill

Estate of Richard King 1 on a 720-acre tract out of the southwest corner of west 3200-acres of Los Indios pasture tract 9 in partition of San Salvador del Tule grant.

Goliad County: The Wilcox trend in Goliad, Bee, Karnes, DeWitt, and Gonzales Counties is active with wildcats finding oil and gas shows while operators are shooting prospects and staking new locations. Continental Oil Company's latest wildcat records shows in Coutret 1, 3 miles south of old Cabeza Creek shallow field where it is drilling and coring below 8700 feet after logging a sand at 8393-8415 feet that carried gas-distillate odor. A drill stem test was run at 8450 feet but details have not been announced.

Discovery: Charles E. Fraser, Inc.'s, Bruni Estate 1-447, wildcat discovery of shallow field 6 miles south of Bruni in southeast Webb County flowed estimated 115 barrels through open 2-inch tubing from perforations at 1810-12 feet. Production is from Cole sand, topped at 1793 feet which showed gas in top and oil in botom. Total depth is 1812 feet.

Texas Gulf Coast

Two Fields Being Opened In Colorado County

Two new oil fields in different sand levels are being opened in Colorado County, an area that is due to have more deep sand development this year. Ohio Oil Company is opening Cockfield-sand field 6 miles southwest of Garwood where McDermott 1, in west corner of AB&M survey 702, flowed 60 barrels of condensate and 6,000,000 cubic feet of gas daily through ¼-inch choke on drill-stem test. Perforations were made at 6510-20 feet. Before shooting these holes, perforations above and below the sand section were made to shut off water. The shut-in pressure mounted to 2450 pounds. Tubing has been run for completion test.

Jack W. Frazier and Cities Service Oil Company are running completion test on Gay 1, wildcat 3 miles northwest of Columbus, Colorado County. On a drill-stem test the well flowed at rate of 44 barrels of condensate and 1,550,000 cubic feet of gas daily on ¼-inch top and bottom chokes. The test was made in perforations at 7810-12 feet inside Wilcox, working pressure mounting to 1100 pounds, shut-in pressure rising to 2400 pounds. These holes have been squeezed and perforations are being made at 7675-80 feet in the top sand section.

Extension: Sun Oil Company has completed a major north extension to Fig Ridge field, Wharton County, where Federal Land Bank 1, T&NO 81, abstract 251, flowed 109 barrels in 11 hours through 10/64-inch choke with tubing pressure of 1100 pounds. Perforations were made above the total depth of 8633 feet, with 5½-inch casing set to bottom. This field is slowly being developed into a major reserve.

Providence Oil Company has completed a southwest extension to the expanding Clodine field, Fort Bend County, where Dorrance & Wing 1 topped pay sand at 7498 feet, drilled to 7501 feet and set 5½-inch casing to bottom. Perforations were made at 7498-99 feet and the flow was 102 barrels daily through

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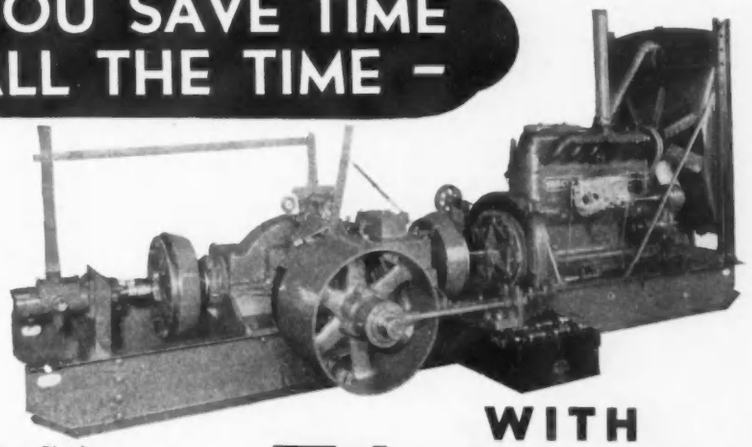

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Another extension for the South Anahuac area, Chambers County, is indicated with Salt Dome Oil Company completing Ogden 1, an old well reentered and perforated at 9005-50 feet. Total depth is 9050 feet with 5½-inch casing set to bottom. On test the well flowed gas and condensate.

Tyler County: Humble Oil & Refining Company has announced it will drill another test in the recently discovered Rockland field, at Kountze 2, on a 80-acre tract in lot 11, Emily Smyth survey. It is 2283 feet southeast of Kountze 1 which opened the field and which unofficially flowed 23 barrels in 24 hours on different size chokes from perforations in a 3400-foot Carrizo-Wilcox sand.

South Louisiana

Activity in Pine Prairie Field Is Most Intense

The Pine Prairie field in Evangeline Parish continues as the most active area on the coast. Although drilling has been carried on steadily for almost two years and three sands are now producing, new locations are being staked and drilled. The wells now drilling are projected to the deeper Wilcox, which has proved prolific.

Latest Wilcox well was completed by The Texas Company and Humble Oil & Refining Company on the west flank at Stewart-LaDanois 1, Section 35-35-1w. Perforated at five levels, it flowed 331 barrels of pipe-line oil daily through 12/64-inch choke, tubing pressure mounting to 1200 pounds. Perforations were made at 10,222-70 feet, 10,276-90 feet, 10,322-96 feet, 10,404-30 feet and 10,444-74 feet, all in Wilcox. Total depth is 10,716 feet with 5½-inch casing set to 10,714 feet.

Gulf Refining Company is active on south and east flanks, which is not yet productive in the Wilcox and Hassie Hunt has rigs running on the southeast and northwest flanks.

St. Landry Parish: Humble Oil & Refining Company is setting casing in Prince 1, wildcat in Section 26-6s-6e, at Krotz Springs. The hole is bottomed at 10,206 feet. This well is southwest of Gulf Refining Company's Haas-Hirsch 1-E, the field discovery, which was recently reworked and flowed 300 barrels of pipe-line oil daily from perforations at 9418-22 feet, through 5/32-inch choke.

Terrebonne Parish: Superior Oil Company of California has set 7⅝-inch casing to 11,277 feet, total depth, in Continental Land and Fur 1, wildcat in Bayou Penchant area, Section 30-18s-14w. Details have not been announced as to what has been found, and the hole is being drilled deeper.

Wildcats: Several deep wildcat wells are preparing to spud. Sun Oil Company is preparing to drill below conductor pipe set at 90 feet in Boagni Estate 1-B, wildcat in Cankton area of St. Landry Parish, Section 48-8s-4e. This will be a deep Miocene test.

Continental Oil Company and Standard Oil Company of Kansas are preparing to get under way in Fee 1, deep wildcat in Section 137-10s-6e, on the flank of St. Martinville dome in St. Martin Parish.

Union Oil Company of California has spudded Edgewood Land and Logging 1, wildcat on Gordon prospect, Section 25-6s-10w, Beauregard Parish. It will be a 7000-foot Cockfield test, with Morris-Hamilton of Houston as contractor.

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ROLLER BEARINGS

North Louisiana

Conservation Department Issues Proration Order

The minerals division of the Louisiana Conservation Department has issued its first proration order, based on 40-acre spacing, in the new Holly Ridge field of Tensas Parish where four wells have been completed and nine other operations have been announced. Producers in the Shelly Sand of the Tuscaloosa formation around 8400 feet, were granted an average allowable of 250 barrels per day.

Five of the 11 active wildcats in North Louisiana, including 3 in Tensas Parish, have been delayed by fishing jobs while over the area 15 wildcats have been shut down, 5 remain locations, 2 are moving in machinery and 3 abandoned.

Tensas Parish: David M. Lide's Fee 1, 22-12n-12e, wildcat, was fishing at 7895 feet. Placid Oil Company's Ayer 1, wildcat, 18-14n-10e, had a stuck drill stem at 9118 feet; Sohio Producing Company's Penrod-Jarden 1, SW SW 8-11n-10e, 2 miles northeast of production was fishing at 8026 feet; Stanolind Oil & Gas Company-Carter's Smith-Glover 1, NW SE 19-11n-10e, south offset to the discovery well, was held up by lost tools at 7700 feet; Carter Oil Company's Marks 1, NW NE, north offset to the discovery

and the nearest well down, was drilling at 8131 feet.

Concordia Parish: Royal Petroleum Corporation's Canebrake 1, 1-8n-10e, wildcat, is drilling below 8400 feet; The California Company's Brown 2, Lake St. John field, is below 7841.

Madison Parish: C. H. Murphey's wildcat, Sonderheimer 1, 10-17n-12e, was last reported below 2175. In Ouachita Parish, Westgate and Greenland's Werner Sawmill No. 2, wildcat, 9-17n-2e, is arranging to plug and abandon. Sohio Oil Company has started drilling at the Moore 1, wildcat located in 2-22n-2e, Union County, and in the same county Westgate and Greenland have abandoned Frost Lumber 1, 26-22n-1e, after drilling to 5033.

Arkansas

Big Gasser Opens Year's First Pool Near Shuler

Arkansas' first new pool for the year came into production last week when The Atlantic Refining Company's Mahony & Murphy 1, Section 2-18-1, two miles northwest of the Reynolds lime pool in the Shuler field, was completed as a gasser estimated to be good for about 50 million cubic feet per day. There was no oil with the flow when it was tested first at 7847 feet. After the hole had been mudded off, a drill-stem test at 7861 feet produced at the rate of 3 barrels of oil per hour on a ⅛-inch choke, with a gas-oil ratio of 11,000 cubic feet per barrel. The well is now waiting on orders, but it is believed likely that further efforts will be made to make an oil well.

The company has made location for Mahony 1, C SE NE 3-18-18, an offset northwest of the discovery.

In the Mt. Holly field, Phillips Petroleum Company completed Davis A-1, C NE NE of 15-17-18, which proved good for 5½ barrels an hour on ⅛-inch choke, from 7194-96 feet.

Columbia County: Preparations went forward this week for recompletion of Phillips Petroleum Company's McWilliams 1, C N½ SE 13-18s-22w, which blew in wild recently, making 3 million cubic feet of gas and 300 barrels of distillate per day. The well has been mudded off and it will be dually completed.

Chicot County: Placid Oil Company is moving in rigs to two new wildcats, Roy Mather 1, NWc 21-18-2, and Parish Coleman 1, NEc 22-18-3.

Mississippi

Cranfield Area Looms As Major Oil Field

The Cranfield area of Adams County, Mississippi, is looming as a major oil field with The California Company opening a deep and apparently prolific sand in National Gasoline Company of Louisiana 2, Section 53-7n-1w.

The company, one of the pioneer operators in the area following discovery of Tinsley, the first field in the state, is running a series of tests after making two sets of perforations at 10,344-381 feet and 10,387-10,391 feet in the Upper Cretaceous. On production test the well flowed 25½ barrels of oil hourly through 3/16-inch choke with tubing pressure mounting to 1890 pounds, gas-oil ratio 920/1.

The well is approximately 1 mile west of the discovery. The company conducted considerable gravity meter and seismograph work in the area to outline the structural high before drilling. Bottomed at 10,469 feet, operators set 7-inch casing to 10,463 feet.

In Jasper County, Gulf Oil Corporation in completing a wildcat discovery, Morrison 1, in Section 30-1n-13e, in the Eutaw formation, after plugging back from the Tuscaloosa, which showed no oil. The well which opens the Heidelberg field, was plugged back from a total depth of 6578 feet to the Eutaw pay bottom of 4968 feet, casing perforated to 10 feet higher. The well was flowing 15 barrels per hour 19-gravity oil through ⅜-inch choke on production test, with a small amount of gas, but was expected to do better when cleaned out. It is being produced through tubing with bottom choke.

Indian Lease Sale

Leases for oil and gas are being offered on restricted lands in Oklahoma, tracts in 10 counties being offered. Bids will be opened at 10:00 a.m., February 8 at the office of A. M. Landman, Superintendent, Indian Agency, Muskogee. A single tract is being offered in each of the following: Creek, Hughes and Marshall Counties. Two tracts are for lease in Garvin and Carter Counties while in McClain and Seminole Counties there are six tracts, in Okfuskee there are 9 and in Coal County there are 11 tracts offered.

Rocky Mountain Area

Wildcats Abandoned as Others Drill Tensleep

O. E. Torrey's J. W. Ruff 1, C SW NE 24-13s-49w, Cheyenne County, Colorado, wildcat, has been abandoned at 4861 feet, after developing only a slight showing of oil at 4774-76 feet in the Marmaton lime, objective of the test. The well is located on a 20,000-acre block assembled by Torrey and associates, and a mile south of Gulf Oil Corporation's test drilled in 1938 which failed to produce commercially from lime at 4813 feet.

Lance Creek Wildcat: Superior Oil Company's Ong 1, C SE SW 31-36n-65w, wildcat test on the northwest flank at Lance Creek, Wyoming, is being abandoned at 10,910 feet after encountering water in both the Dakota and Basal Sundance. The Dakota sand at 8723-56 feet was perforated with 111 shots and acidized with 1000 gallons. The Ong well set a depth record for the Rocky Mountain region.

Garland Test: General Petroleum Corporations' Howell 1, Lot 63, 32-56n-97w, wildcat on the southwest flank of the Garland field, Wyoming, is setting 7-inch casing for water shut-off preparatory to drilling in the Tensleep at 4325 feet. Good saturation was reported in Embar at 4217-50 feet and on drill-stem test open 45 minutes the well yielded 8 barrels of oil cut with mud and water.

Steamboat Butte: British - American Oil Producing Company's Tribal 2-C

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For a one-hoss outfit only 36 years old we ship quite a little stuff. Fifty thousand shipping tags and a few parcel post labels go so fast we need tracer bullets. And a lot of our stuff is sold FOB the store. Our customers like to come around. Always have. We don't greet 'em with "Can I help you, sir?" It's more likely to be "Hello, you old so-and-so! How's your rheumatism?" Or, since we are now working on the second and third generation, it may be "Hi, kid! How are the growing pains?" All of which adds up to this: A lot of people in the oil business TRY PELCO FIRST for supplies and equipment. If they don't get merchandise they get appreciation.

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NE NE SE 31-4n-1w, Tensleep test in the Steamboat Butte field, Fremont County, Wyoming, is coring for the Tensleep at 6661 feet. Top of the Embar was logged at 6443 feet and a drill-stem test in this zone yielded 160 feet of oil-cut mud, no gas or water.

Steamboat Butte was a major discovery in 1943 in the Sundance and three wells have been completed in this horizon. The Pilot Butte field, just south of Steamboat, produces from the Tensleep.

☆

E. W. MASTERS has been made production manager for Shell Oil Company in charge of all Pacific Coast properties. S. F. Bowlby succeeds him in his former post as manager of the San Joaquin division.

California

Six Wildcats Abandoned And Seven Are Started

Extension tests netted the only discoveries of new oil this week, none of great importance. Six wildcats were abandoned and seven new ones were started.

The extensions included a small widening of pay limits in 2-32-23, Sunset-Midway field; a short stepout in the new Sharktooth field that produced a pumper making the surprisingly high rate for that shallow play of about 500 barrels; and opening up of good-looking sand in the Symons zone in the Paloma area, a quarter mile beyond production limits of that field. All are in Kern County.

Of special interest among the new wildcats announced this week are Richfield Oil Corporation's test of a Tejon Ranch area, Kern County, five miles north of the field discovered on this property several months ago; Seaboard Oil Company's try in the heart of Los Angeles, seeking a field under Elysian Park; and Chanslor Canfield Midway Oil Company's second effort to open production in the East Whittier area, Los Angeles County.

Glenn County: Moving in directly from the site of a failure in its initial test in the Orland area, General Petroleum Corporation has started a second wildcat, Dolan 1, C SW NE 33-23-3. Objective, involving large acreage shared with Union Oil Company, is gas production.

Kern County: A deep test attracting more than ordinary attention is Standard Oil Company's new wildcat, Ethel D. S., SE NW SE 36-12-24, on Thirty-five Anticline, Maricopa Flat, in the Midway field.

A long-favored area seven miles west of Belridge, with indicated possibilities of a structure similar to the rich deep pay of that field has been leased by Bandini Oil Corporation, and the operators announce preparations for a first try planned for about 10,000 feet.

Los Angeles County: Wilmington field, with daily production that last week passed the 100,000-barrel mark, is slated for a year of intensive new development that already has got away to a fast start. Tar, Ranger and Ford zones, left untapped in great numbers of wells during the early years of flush production when heavy flow from Terminal zones made restriction necessary, now are to be opened up. Union Pacific Railroad Company this week filed a single block of 16 new locations. Other large operators are known to be mapping comparable programs.

Orange County: The Buena Park area, despite unfavorable results from a formidable list of wildcat casualties in recent years, again is under test. The new wildcat, General Petroleum Corporation's Heath 1, is in Section 34-3-11.

Michigan

Third New Field Prospect In Montcalm County

The third new field prospect for 1944, Burks White and Stewart Oil Company's Jorgensen 1, C NE NE 14-12n-6w, Home Township, Montcalm County, flowed 86 barrels of oil the first 20 hours on test from Dundee lime at 3474-77 feet. Top was at 3470 feet. It was the first Dundee production established in this area, first tested in 1934 when wildcatting brought discovery of a small Traverse lime pool and later a shallow Stray sand gas field. Previously drilled dry holes appear to limit prospect to 1000 acres or less.

Mecosta County: Sun Oil Company's Drake 1, S½ NE SW 18-16n-7w, a mile south of the developed Fork field, drilled Dundee lime objective at 3915-29 feet to apparently block extension of the pool south.

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United States Well Completions

ARKANSAS

Nevada County—Smart: McAlester Fuel Oil Co.'s Williams C-2, 1-15s-20w, pump 200 bbls, Travis Peak 3600 ft.

Union County: Phillips' K. L. Davis (Ted A-1), c ne ne 15-17-18, ½ bbl per hr, ⅛-in, 1200 lbs, td 7260 ft.

ARKANSAS WILDCAT

Union County — Discovery: Atlantic's Mahony and Murphy 1, c of nw sw 2-18-18, northwest of Shuler area, 50,000,000 gas fr 7847 ft, 3 bbls oil per hr, 11,000/1, ⅛-in 7861 ft.

CALIFORNIA

Fresno County—Coalinga: Shell's 138-29, sw sw se 29-19-15, pump 150 bbls, perf 2207-2090 ft, Black shale 1952 ft, td 2208 ft.

Standard's 207-13D, sw nw sw 13-20-14, pump 39 bbls oil, 5 wtr, perf 538-695, 718-810 ft, td 815 ft.

Standard's 77-11A, sw ne sw 11-19-15, abnd 2125 ft.

Kern County—Belridge, South: Atlantic Oil Co.'s St. Clair 4, se se ne 2-29-21, pump est 60 bbls, 171 ft perf 1094 ft, td 1097 ft.

Atlantic Oil Co.'s St. Clair 7, se sw nw 1-29-21, pump est 60 bbls, perf 943-1036, 1051-1116 ft, td 1188 ft.

Belridge Oil Co.'s 15A-28, nw nw sw 28-28-21, pump 45 bbls 14-gr oil, 25 wtr, 428 ft perf 1017 ft, td 1060 ft.

Belridge Oil Co.'s 55-34, nw nw se 34-28-21, pump 65 bbls 14.5-gr oil, 5 wtr, 526 ft perf 1075 ft, td 1075 ft.

General Petroleum Corp.'s 34-2, nw nw se 2-29-21, pump 68 bbls 13.2-gr, perf 559-649, 695-760 ft, td 760 ft.

Shell's F. K. L. 12, nw sw se 1-29-21, pump 48 bbls 13.5-gr oil, 17 sand, perf 1122-1104, 1070-990, 950-930 ft, td 1176 ft.

Kern County—Buena Vista Hills: Standard's 111-35B, nw se sw 35-31-23, pump 50 bbls 29.5-gr oil, 23 wtr, 290 ft perf 3215 ft, td 3220 ft.

Kern County—Edison: Monterey Exp. Co.'s Citizens 2, sw se sw 14-30-29, pump 5 bbls 14.6-gr, perf 1800-20, 1840-45 ft, td 1850 ft.

Kern County—Kern Front: Standard's 10-1, nw ne ne 21-28-27, pump 69 bbls 13.1-gr oil, 25 wtr, 201 ft perf 2665 ft, td 2670 ft.

Kern County — Kern River: Tide Water's Chicago Crude 14, nw se nw 30-28-28, pump 25 bbls 13.5-gr oil, 30 wtr, 440 ft perf 1220 ft, td 1220 ft.

Kern County — Midway - Sunset: Chanslor Canfield Midway Oil Co.'s 69, se sw se 9-32-23, pump 36 bbls 16-gr oil, 8 wtr, 99 ft perf 1840 ft, td 1850 ft.

General Pet. Corp.'s Moco 35-393, se sw se 35-12-24, pump 110 bbls 13.4-gr oil, 73 wtr, perf 1837-2014, 2064-2131, 2160-2282 ft, td 2284 ft.

Kern County—Mount Poso: Ring Oil Co.'s Shapiro 10, sw nw nw 32-26-28, pump no est, 26 ft perf 1725 ft, td 1725 ft.

Kern County—Paloma: Western Gulf's Unit 34-4, sw se nw 4-32-26, swabbed salt water, trace oil and gas, abnd 10,429 ft.

Kern County—Poso Creek: Pacific Western's Enas Fee 36, sw nw sw 21-27-27, pump 19 bbls 13.2-gr oil, 4 wtr, 41 ft perf 2070 ft, td 2070 ft.

Kern County — Poso Creek - Premier: Westates Pet. Corp.'s Cauley 48, sw se sw 16-28-27, pump 25 bbls 13.9-gr oil, 6 wtr, perf 2738-13, 2688-54 ft, td 2868 ft.

Westates Pet. Corp.'s Cauley 49, 904 ft n 1320 ft e swc 16-28-27, pump 94 bbls 13.9-gr oil, 62 wtr, 177 ft perf 2908 ft, td 2908 ft.

Kern County—Tejon: Richfield's A 25-35, ne sw nw 35-11-19, pump 76 bbls 18.1-gr, 73 ft perf 2638 ft, top oil sand 2572 ft td 2795 ft, pb 2640 ft.

Kings County—Pyramid Hills: Pacific Oil & Gas Dev. Corp.'s 2, se se sw 17-24-18, pump 50 bbls 15.2-gr, 135 ft perf 920 ft, td 935 ft, pb 920 ft.

Los Angeles County — Long Beach: Texas Co.'s Fields D-1, 530 ft nly alg California Ave, fr c/l Spring St thence 330 ft wly at r/a, 19-4-12, pump 32 bbls oil, 35 wtr, perf 7930-7810 ft, td 10,324 ft.

Los Angeles County—Wilmington: Axis Pet. Co.'s G-2, 1725 ft n 500 ft w c/l Sandison and Sandford Aves, pump 60 bbls 13.5-gr, td 3763 ft, pb 3731 ft.

General Pet. Corp.'s Ford 28, 3171 ft s 911 ft e c/l Ford and Anaheim, pump 125 bbls 14.3-gr oil, 40 wtr, 101 ft perf 2706 ft, td 2707 ft.

Long Beach Oil Dev. Co.'s "W" 71, 260 ft nely alg n/l Seaside fr e side 23rd Ave thence 150 ft sely at r/a, pump 168 bbls, perf 3407-3626 ft, td 3627 ft.

Orange County—Huntington Beach: Huntington State Co.'s State 6, 124 ft swly 244 ft nwly fr c/l 21st and Ocean, flow 323 bbls 19.4-gr, 12/64-in, 260/400 lbs, perf 2300-2500, 2558-2960, 2990-3495 ft, td 3522 ft.

Standard's J-2 1109 ft s 225 ft e c 35-5-11, pump 40 bbls 16-gr oil, 10 wtr, 32 ft perf 3995 ft, td 4006 ft.

Standard's A-55, 3251 ft wly alg c/l Wesley Ave fr c/l 23rd St, thence 1001 ft sly at r/a, pump 25 bbls 14-gr oil, 25 wtr, 208 ft perf 3368 ft, td 3370 ft.

Orange County—Yorba Linda: Shell's Olinda Fee 4 76-16, 3078 ft n 944 ft w c/l Citrus and Eureka Aves, flow 124 bbls 18.2-gr oil, 25 wtr, 550,000 gas, 52/64-in, 100/375 lbs, perf 2022-1993, 1975-19, 1834-1794 ft, td 2028 ft.

Santa Barbara County—Lompoc: (Old well deepened) Union's Purisima 17, 35-8-34, pump 116 bbls oil, 55 wtr, 224 ft perf 2824 ft, otd 2681 ft, td 2825 ft.

Ventura County — Rincon: General Pet. Corp.'s Ferguson 6, 1670 ft swly alg w/l Ferguson lse fr nwc thence 126 ft ely at r/a, 7-3-24, flow 660 bbls 31.2-gr, 24/64-in, 340/0 lbs, 104 ft perf 2850 ft, td 2851 ft.

Ventura County — Ventura Avenue: Shell's Taylor 169, 2764 ft s 8123 ft w, R. C. L. Cor. 11, flow 403 bbls 30.4-gr oil, 392,200 gas, 40/64-in, 200/600 lbs, 648 ft perf 5397 ft, td 5400 ft.

CALIFORNIA WILDCATS

Fresno County—Failures: Shell's San Joaquin 1-1, c se ne 9-15-17, Raisin City area, few streaks sand 6295-6318 ft, Kreyenhagen shale 6294 ft, abnd 6380 ft.

Amerada's Furtado 55-36, sw sw ne 36-17-19, Riverdale area, abnd 8185 ft.

Glenn County—Failure: General Pet. Corp.-Union's Otland Comm. 8-1, c nw nw 11-21-3, Orland area, grassy mud salt water on test 1825-72 ft, abnd 3223 ft.

Kern County — Failures: Amerada's S. P. 2-15, sw nw nw 15-29-29, Ant Hill area, top 4345 ft, abnd 4387 ft.

George C. Nelson's Nelson-Hooper 1, se nw 36-26-27, Mount Poso area, barren Vedder 2565 ft, abnd 2592 ft.

Los Angeles County—Failure: Chanslor Canfield Midway Oil Co.'s East Whittier Comm. 1-1, 34-2-11, gray sand, abnd 5571 ft.

COLORADO

Cheyenne County—Kit Carson District: O. E. Torrey's J. W. Ruff 1, c sw ne 24-13s-49w, abnd 4861 ft.

ILLINOIS

Coles County: Cooperative Oil Co.'s Fee 1, sw se se 7-11n-11e, Casey 261-303 ft, 351-370 ft, Miss 374-420 ft, 11 bbls, 420 ft.

Clay County: J. J. Lynn's W. Welldt 1, nw se ne 30-3n-6e, abnd 3019 ft.

J. V. Dunbar's Liggett 2, nw ne se 17-5n-5e, AV 2322-40 ft, 18 bbls, 2409 ft.

Shell's L. Moss "B" 1, ne sw se 22-5n-5e, AV 2352-58 ft, 53 bbls, 2360 ft.

Texas' J. J. Rush "B" 1, sw ne ne 22-5n-5e, AV 2332-37 ft, 41 bbls, 2339 ft.

Edwards County: Superior's J. W. Judge et al 1, se ne se 36-2s-10e, Walts 2361-77 ft, 130 bbls, 2377 ft.

Franklin County: Phillips' Whittington 1, nw ne sw 19-5s-3e, abnd 3080 ft.

E. S. Adkins' C. W. & F. Coal Co. 13-W, ne se sw 36-6s-2e, TS 2090-2127 ft, 11 bbls, 2127 ft.

E. S. Adkins' S. Boner 2DD, nw ne nw 31-7s-3e, otd 2200 ft, abnd 3156 ft.

Hamilton County: Ohio's L. L. York 1, ne sw ne 27-4s-7e, abnd 3348 ft.

Texas' M. Davis 2, nw nw se 18-6s-6e, abnd 3393 ft.

Texas' Johnson Comm. 2, nw sw se 26-6s-6e, abnd 3108 ft.

Jasper County: Continental's Provident Mutual Life 1, se sw sw 28-6n-9e, salt water disposal well, 3127 ft.

Jefferson County: Central Pipe Line Co.'s c ne se 13-2s-4e, McCl 3052-56 ft, 3063-67 ft, 3072-78 ft, 494 bbls, 3089 ft.

Kiowa Drlg. Co.'s Pallock Heirs 1, se sw 24-2s-4e, abnd 3165 ft.

Richland County: Pure's Shatto Cons. 1, s½ frac nw, 30-3n-9e, McCl 2978-92 ft, 528 bbls, 3061 ft.

Wabash County: Cities Service's Wheatley 1, se sw ne 3-1s-13w, Biehl 1719-32 ft, Cyp 2313-24 ft, Pale 1822-41 ft, 300 bbls, 2329 ft.

Magnolia's Clay Moeller 1, nw sw ne 5-1s-12w, Cyp 1991-2010 ft, 35 bbls, 2010 ft.

Texas' Stein 4, nw sw nw 8-1s-12w, TS 1715-25 ft, Weil 2032-37 ft, 104 bbls, 2043 ft.

George & Wrather's Zimmerman 8, sw nw se 9-1s-12w, McCl 2366-73 ft, 170 bbls, 2373 ft.

British American's F. C. Metcalf 3-B, sw sw ne 31-3s-14w, abnd 1574 ft.

Wayne County: Deep Rock's Perry-Young Comm. 1, ne nw 32-1s-7e, L O'H 3198-3206 ft, McCl 3249-57 ft, 207 bbls, 3260 ft.

Buren McGregor's M. Buss 2, sw sw 33-1s-7e, McCl 3266-71 ft, 70 bbls, 3271 ft.

Collins Brothers' Weir 1-A, nw nw ne 27-1s-8e, Rosi 3159-65 ft, 93 bbls, 3176 ft.

Cities Service's Boggs "D" 1, se ne ne 32-2s-9e, L O'H 3256-59 ft, Rosi 3276-82 ft, 77 bbls, 3359 ft.

ILLINOIS WILDCATS

Clark County—Failures: Frank Mitchell et al's H. Weir 1, sw ne se 12-9n-13w, abnd 1500 ft.

Eason Oil Co. et al's Peters 1, nw ne ne 29-5n-7e, abnd 2946 ft.

Edwards County—Failures: Superior's V. A. Curtis 1, nw sw ne 32-1s-14w, abnd 3147 ft.

Fred Noah et al's E. West 1, s½ se nw 28-2s-10e, abnd 3305 ft.

Fayette County—Failure: Texas' Stokes 1, sw nw nw 7-8n-1e, abnd 3663 ft.

Franklin County—Failure: Aetna Oil Co. et al's U. S. Coal & Coke Co. 1, se se nw 8-6s-4e, abnd 3199 ft.

Hamilton County — Failure: Halbert &

Wells Completed in United States in Week Ended January 29, 1944

Data preliminary and subject to revision. Revised and more complete data on all completions shown in monthly summary of drilling, published in second issue of each month. More detailed data on wildcats published in third issue of each month.

State or District	FIELD COMPLETIONS: New Wells *Oil	Gas	†Input	Dry	Total	Old Wells Deepened	WILDCAT COMPLETIONS *Oil	Gas	Dry	Total	ALL COMPLETIONS: This Week	Last Week	Cumulative: This Year	Last Year
Arkansas									2	2	2	4	12	14
California	31			1	32				6	6	38	28	146	90
Colorado									1	1	1	1	2	3
Illinois	16		1	8	25				10	10	35	32	155	144
Indiana	4			1	5				1	1	6	1	28	22
Kansas	23	2		11	36	1			7	7	44	21	181	121
Kentucky	5			4	9		1		4	5	14	6	41	18
Louisiana	4				4				1	1	5	10	41	42
North Louisiana												2	6	10
South Louisiana	4				4				1	1	5	8	35	32
Michigan	5			2	7				5	5	12	8	54	31
Mississippi													3	3
Missouri														1
Montana	4			2	6						6	7	27	12
Nebraska									1	1	1	5	6	1
New Mexico	6				6				1	1	7	5	35	21
New York												25	97	107
Ohio	2	5		3	10						10	12	46	78
Oklahoma	7	3	1	5	16		1		6	7	23	22	135	110
Pennsylvania	28	5	14	7	54						54	49	246	190
Tennessee														1
Texas	49	1		17	67	3	4		10	14	84	82	426	302
East Texas	2				2						2	4	24	12
North Texas	11			2	13	1	1		2	3	17	12	89	67
W. Central Tex.	1			6	7				1	1	8	6	32	22
West Texas	25			1	26	2			2	2	30	25	111	64
Tex. Panhandle	1	1			2						2	2	14	25
G. Coast, Upper	1			2	3		2		2	4	7	6	38	21
G. Coast, Lower	4			5	9						9	17	78	47
Southwest Texas	4			1	5		1		3	4	9	8	36	39
S. Central Tex.													4	5
West Virginia	1	11		3	15						15	12	92	64
Wyoming	3				3				1	1	4	6	14	7
Total U.S.	188	27	16	64	295	4	6		56	62	361	336	1,787	1,382

* Includes distillate wells. † Includes salt water disposal wells.

Leach's Leach Gilpin 1, sw ne 14-4s-6e, abnd 3563 ft.

St. Clair County—Failure: G. A. Morris' Albert 1, sw nw nw 16-1s-9w, abnd 238 ft.

Washington County—Failure: Harry Hubbard's H. Schriefer 1, nw nw nw 3-1s-3w, abnd 1455 ft.

Wayne County—Failure: Kingwood's Burkett 1, sw sw nw 26-1n-5e, abnd 3153 ft.

INDIANA

Gibson County: Chester Oil Co.'s G. W. Shoultz 1, nw se se 17-1s-9w, Hds 1268-73 ft, 35 bbls, 1273 ft.

Superior Oil Co.'s S. B. Thompson Unit 3, se se nw 25-2s-12w, Cyp 2017-26, 30 bbls, 2026 ft.

Jay County: Fred G. Turner's Fee 1, ne se ne 5-24n-13e, abnd 1036 ft.

Posey County: Bennett Brothers' Spencer 1, ne se sw 32-6s-14w, TS 2143-50 ft, 86 bbls, 2150 ft.

Spencer County: Fred Pfunder's Martin Smith 2 (3), sw nw nw 6-7s-7w, Walt 1027-47 ft, 15 bbls, 1051 ft.

INDIANA WILDCAT

Randolph County—Failure: H. L. Simmons' Ora Potter 1, ne ne nw 15-21n-14e, abnd 1095 ft.

KANSAS

Barber County—Sun City: Mid-Continent's Massey 2, c sw se¼ 22-30s-15w, Lansing 3936 ft, Topeka 3135 ft, td 4445 ft, pb and abnd 3720 ft.

Barton County—N. Beaver Area: Bodine Drlg.'s Hilgenberg 1, ne ne ne¼ 5-16s-12w, Arbuckle 3302 ft, abnd 3308 ft.

Barton County—Feltes Area: F. C. Koch's Weber 1A, c ne sw¼ 12-16s-12w, Arbuckle 3302 ft, pump 459 bbls oil, 3308 ft.

Barton County—Kraft-Prusa: Gulf's Martha Case 2, ne nw nw¼ 25-16s-12w, Arbuckle 3351 ft, swab 64 bbls oil per hr for 2 hrs, 3364 ft.

Shell's E. Harthel 3, ne ne nw¼ 15-17s-11w, Arbuckle 3303-08 ft, 750 gals acid, fill 2500 ft wtr in 14 hrs, abnd 3333 ft.

Butler County—Eldorado: Deep Rock's Robinson 47, nw nw sw¼ 16-25s-5e, perf Miss chat 2430 ft, Viola 2562 ft, pump 150 bbls oil fr Miss, 110 bbls oil fr Viola, 2600 ft.

Cities Service's Pirtle 25, ne nw ne¼ 19-25s-5e, Miss chat 2492 ft, shot with 150 qts, pump 20 bbls oil, 2590 ft.

Cities Service's Finney 22, se ne sw¼ 4-26s-5e, Miss 2470-80 ft, Simpson sand 2500 ft, shot 60 qts, pump 5 bbls oil, 2551 ft.

Butler County—Brandt-Sensenbaugh: Adair-Morton's Farner 1, sw ne sw¼ 2-28s-7e, Miss 2776 ft, 2500 gals acid, pump 125 bbls oil, td 2801 ft, pb 2796 ft.

Coffey County — N E Winterscheid: Vannocker's Scott 1, sw sw ne 13-23s-14e, Miss 1588 ft, pay 1613-18 ft, pump 8 bbls oil, 12 bbls wtr, 1589 ft.

Cowley County — Deichman: Trees Oil's Deichman 2, c s½ nw sw¼ 24-31s-4e, Bartlesville sand 2869 ft, shot 80 qts, flow 642 bbls, 2911 ft.

Cowley County—Rahn: Ben Grallap's Ruth Rahn 2, ne sw se¼ 14-34s-5e, Bartlesville sand 2955 ft, shot 30 qts, flow 259 bbls, 2995 ft.

Ellis County — Bemis: Champlin Refg.'s Peavey "B" 1, c e½ se sw¼ 30-11s-17w, Arbuckle 3609 ft, 1000 gals acid, pump 202 bbls oil, 3633 ft.

Ellis County—Riverview: Champlin's Johnson 3, se sw nw¼ 29-11s-18w, Arbuckle 3611 ft, 500 gals acid, pump 700 bbls, 3623 ft.

Finney County — Menn Area: Atlantic's Gobleman "B" 1, se nw nw¼ 35-21s-34w, Miss 4640 ft, perf cas 17,800 gals acid, pump 10 bbls, 4791 ft.

Graham County—Morel: Continental's Putnam Investment 2, sw sw nw¼ 23-9s-21w, Arbuckle 3806 ft, 500 gals acid, swab 100 bbls oil in 2 hrs, 5422 bbls, 3815 ft.

Greenwood County — Pixles: Barbara Oil's Browning 21, sw nw se¼ 17-22s-10e, Bartlesville sand 2331 ft, shot 20 qts, pump 42 bbls oil & salt wtr in 33 hrs, 2341 ft.

Leavenworth County—Jerbalo: Miller's Bell Estate 5, se nw nw¼ 7-10s-21e, Miss 1378 ft, abnd 1408 ft.

McGuire et al's Murphy 1, c w½ ne sw¼ 9-10s-21e, sand 1234 ft, 17,000,000 gas, 1256 ft.

Marion County — Fanska: Nelson Drlg.'s Tarn 1, c w½ sw sw¼ 6-17s-1e, Miss chat 2682 ft, pump 140 bbls oil, 5% wtr, 2690½ ft.

Marion County—Lost Springs: Derby Oil's Sklemar 1, se sw sw¼ 15-17s-4e, Miss 2403-06 ft, pump 25 bbls oil, 75 bbls wtr, 2462 ft.

Ness County—Aldrick: Magnolia's B. Olson 2, se nw se¼ 33-17s-25w, Miss 4284 ft, 1500 gals acid, pump 75 bbls oil, 75 bbls wtr, td 4324 ft, pb 4316 ft.

Pratt County—Carmi: Skelly's Miskiman 1, c se nw¼ 32-26s-12w, Arbuckle 4288 ft, 2500 gals acid, flow 346 bbls oil in 12 hrs, ½-in, 4313 ft.

Shell's Brown 1, sw sw se 35-26s-13w, Arbuckle 4406 ft, abnd 4463 ft.

Bridgeport's Beck "F" 1, sw nw se¼ 36-26s-13w, Arbuckle 4351 ft, abnd 4395 ft.

Rice County—Unnamed: Phillips' Click 2, se ne nw¼ 3-18s-7w, Arbuckle 3513 ft, abnd 3523 ft.

Rice County—Volkland: Phillips' Volk 4, ne sw sw¼ 27-18s-9w, Arbuckle 3231 ft, swab 108 bbls in 3½ hrs, 3238 ft.

Rice County—Bornholdt: Phillips' Hansen 1, c se nw¼ 36-20s-6w, Miss 3303-0 ft, shot 20 qts, pump 303 bbls, 3347 ft.

Rooks County—Richards: Phil-Han's Eggleston 1, sw sw sw¼ 33-10s-18w, Solid Arbuckle 3747 ft, abnd 3767 ft.

Russell County—Hall-Gurney: Texas Co.'s D. Boxberger 1, c se nw 15-14-11w, 1000 gals acid, pump 454 bbls, 3036 ft.

Russell County—Davidson: Mid-Plains' Chegwidden 1, sw sw se¼ 29-15s-11w, Lansing 2965 ft, 12,000,000 gas, td 3334 ft, pb 3025 ft.

Russell County—NW Gustason: Harry Gore's Kastrup 2, c s½ ne nw¼ 15-15s-12w, Gorham sand 3195 ft, pump 388 bbls, 3200 ft.

Russell County—Boxberger: Duwe & Farris'

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1 122' 535,000 lb. capacity Lee C. Moore derrick
1 8' steel substructure with all timbers
9100' 4½" 16.60 lb. regular Acme full hole drill pipe
2 7¼ x 20' drill collars, all necessary subs
1 20' type J. Hughes conventional core barrel
1 4½" B J elevator
1 Set B J elevator bails
1 3 K. W. Moon generator
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■ GEOLOGIST, experienced in sub-surface work, available about March 15. Not subject to draft. For family reasons wishes to be located in Houston. Address: Box 21, c/o The Oil Weekly, Houston, Texas.

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Trading Post Section, THE OIL WEEKLY
P. O. Box 2608 Houston 1, Texas

DeWald 1, sw ne nw¼ 25-15s-15w, Arbuckle 3397 ft, abnd 3417 ft.

Sedgwick County—Derby Gas: Beech Aircraft's Downs Est. 1, c se nw¼ 32-28s-2e, Lansing 2207 ft, shot 5 qts, tested 125,000 gas, td 2230 ft, pb 2225 ft.

Stafford County—Bedford: Magnolia's Hayen Est. 1, c se se¼ 20-23s-12w, Viola 3759 ft, perf 1000 gals acid, swab ½ bbl wtr & sso per hr, abnd 3873 ft.

Shell's Stude 1, se se ne¼ 21-23s-12w, Arbuckle 3857 ft, abnd 3869 ft.

KANSAS OLD WELL DEEPENED

Russell County—Fairport: Sohio's Ed. Oswald "A" 3, nw se sw¼ 8-12s-15w, Lansing 2848 ft, sand 3247 ft, pump 12 bbls hr, otd 3049 ft, td 3257 ft.

KANSAS WILDCATS

Butler County—Failure: Wakefield & Sunray's Lamumyou 1, sec nw 1-29s-6e, Arb 3232 ft, abnd 3265 ft.

Ellsworth County — Failures: Bridgeport's Larson 1, "A", sw nw ne 1-17s-6w, Kinderhook 3185 ft, Kinderhook lime 3220-40 ft, Maquoketa Dol 3414 ft, Viola 3451 ft, abnd 3473 ft.

Falcon-Seaboard's Sinclair Prairie & Harbar 1, Ed E. Janzen, nwc se 23-17s-8w, Maquoketa lime 3327 ft, Viola 3405 ft, Simp 3447 ft, Arb 3507 ft, abnd 3540 ft.

Kiowa County—Failure: Sinclair Prairie's Morfork 1, nwc 2-29s-20w, shows 5628-29 ft, sso 5447-48 ft, abnd 5779 ft.

Marion County—Failure: Falcon-Seaboard's J. E. Plett 1, ne nw nw 29-19s-1e, Lans 2396 ft, Miss 2870 ft, abnd 2880 ft.

Russell County — Failure: Nadel & Gussman's Luermann 1, se se ne 24-15s-13w, Arb 3323-27 ft, sso 3344 ft, abnd 4275 ft.

Trego County—Failure: J. M. Huber et al's Schoenthaler 1, c w½ ne sw 26-12s-21w, abnd lcn.

KENTUCKY

Butler County: Stots et al's Kirby 1, 12-H-22, abnd 1005 ft.

Don Davis et al's Robert McPhearson 1, 13-H-2, abnd 563 ft.

I. B. Green's Ed Summer 3, 13-H-2, Hds 368-79 ft, 10 bbls, 381 ft.

Henderson County: Carter Oil Co.'s Culver Oil & Mineral 4, 24-P-21, Walt 1706-16 ft, 75 bbls, 2677 ft.

J. C. Barnett et al's J. R. Harris 2, 19-P-27, abnd 1354 ft.

W. F. Lacey's Wood 3, 16-Q-22, TS 1856-61 ft, 150 bbls, 1863 ft.

Ohio County: W. E. Hupp's L. Brook 1 (4), 12-M-31, abnd 1618 ft.

Union County: Hiawatha's City of Uniontown 7, 20-P-19, Walt 1723-50 ft, 135 bbls, 1750 ft.

Webster County: Cherry & Kidd's Melton 1, 14-N-24, TS 1881-84 ft, 68 bbls, 1884 ft.

KENTUCKY WILDCATS

Butler County—Failure: C. M. Stotts' O. L. Grubb 1, 8-H-33, abnd 312 ft.

Butler County—Discovery: C. M. Stotts' O. L. Grubb 2, 8-H-33, TS 100-21 ft, 5 bbls, 121 ft.

Daviess County—Failure: White & Coffey's W. Powers 3 (5), 20-O-32, abnd 536 ft.

Hopkins County — Failure: Pure's G. B. Hewlett 1, 5-K-26, abnd 3038 ft.

Webster County—Failure: Texas' Georgia Shields 1, 17-M-21, abnd 1535 ft.

NORTH LOUISIANA

Lincoln Parish—Simsboro Gas Field: Arkansas Louisiana Gas Co.'s E. R. Hayes 1, perf 6590-617 ft, td 6709 ft. Completed as gasser, closed in without gauge.

NORTH LOUISIANA WILDCATS

Caddo Parish—Failures: H. C. Owen's Pat Fuller 1, c se ne 4-22n-15w, plugged and abnd 6200 ft.

Delta Drilling Co.'s J. W. Dunn 1, 14-17n-16w, dry and abnd 6431 ft.

Union Parish — Failure: Westgate - Greenland's Frost Lumber Co. 1, 26-22n-1e, dry and abnd 5033 ft.

SOUTH LOUISIANA

Evangeline Parish—Pine Prairie: Texas Co.-Humble's Stewart-LaDanois 1, w flank, 3623 ft n 1596 ft e of sw cor 35-3s-1w, 5½-in 10,714 ft, perf 10,144-74 ft, 331 bbls, 12/64-in, td 10,716 ft.

LaFourche Parish—Delta Farms: The California Co.'s Delta Farms 13, begin sw cor 31 go e 652 ft, th n 1° w 652 ft to lcn in 31-16s-23e, 7-in 9165 ft, perf 9010-52 ft, 275 bbls, 9/64-in, td 10,759 ft.

St. Charles Parish—Lake Salvador: Texas Co.'s State-Lake Salvador 21, n 38° 29 mins w 20,870 ft fr USCGS Mon "In" in Lake, T-16s-22e, 5½-in 10,005 ft, perf 9370-80 ft, 207 bbls, ⅛-in, td 10,005 ft.

Terrebonne Parish — Northeast Gibson: Shell's Realty Operators 19-B, start ne cor sec 16, go sw'ly 4462 ft alg el of sec, th n 58° 53 mins w 198 ft to lcn in 16-17s-15e, 5½-in 9540 ft, perf 9595-11 ft, 308 bbls, 9/64-in, td 9540 ft.

SOUTH LOUISIANA WILDCAT

Iberia Parish—Failure: Phillips' Stewart 1, 2½ mi sw New Iberia field, Grand Marais area, 42-12s-7e, abnd 12,508 ft.

MICHIGAN

Arenac County — Moffatt: Don Rayburn's State A-2, n½ ne nw 33-20n-3e, Dundee, abnd 2982 ft.

Mecosta County — Fork: Smith Petroleum Co.'s Winchester 2, s½ se nw 7-16n-7w, Dundee, flow 240 bbls, td 3880 ft.

Sun Oil Co.'s Drake 1, s½ ne sw 18-16n-7w, Dundee, abnd 3929 ft.

Newaygo County—Goodwell: Cities Service's Billingsley 2, e½ sw se 5-14n-11w, Traverse, flow 47 bbls, td 2807 ft.

Pure's Fredenburg 1, e½ sw sw 5-14n-11w, Traverse, flow 215 bbls in 6 hrs, td 2842 ft.

Osceola County—Rose Lake: Ohio Oil Co.'s Howe 4, se sw sw 31-19n-9w, Traverse, flow 209 bbls, td 3114 ft.

Van Buren County — Breedsville: Socony Vacuum's Varnum 3, se sw sw 24-1s-16w, Traverse, flow 39 bbls, td 1075 ft.

MICHIGAN WILDCATS

Allegan County—Failure: Southwest Dev. Co.'s MacDougall 1, ne se ne 23-2n-12w, Traverse 1701 ft, td 1767 ft.

Isabella County—Failure: C. L. Maguire's Hoag 1, n½ nw se 11-13n-4w, Dundee 3668 ft, td 3699 ft.

Newaygo County—Failure: Fisher-McCall's Schlatter 1, n½ nw se 30-14n-14w, Traverse 2116 ft, td 2275 ft.

Ottawa County—Failure: Welsh Oil Co.'s Timmerman 1, se nw sw 23-8n-14w, Traverse, td 1935 ft.

Tuscola County—Failure: Gulf Refining Co.'s Wiley 1, ne sw se 5-13n-9e, Monroe 3124 ft, Sylvania 4113 ft, td 4138 ft.

MONTANA

Glacier County—Cut Bank: Carter Oil Co.'s Fee 13, c se nw 13-33n-6w, shot 60 qts at 3013-27 ft, swab 100 bbls, Cut Bank 2985-3029 ft, td 3031 ft.

Carter Oil Co.'s Madison 2, c nw nw 30-34n-

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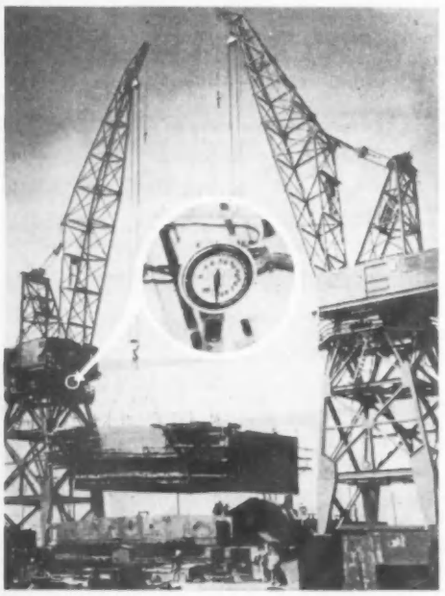

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Par Oil Co.'s Tribal 2, nw sw se 13-32n-6w, 7-in 2997 ft, swab 23 bbls, shot 252 qts 3019-33 ft, Cut Bank 2976-3033 ft, td 3048 ft.

Toole County — Kevin - Sunburst: Dakota-Montana Oil Co.'s Curran 1, sw nw se 6-36n-2w, Ellis-Madison 1985 ft, abnd 1988 ft.

Texas Co.'s Howling 9, ne ne sw 10-35n-2w, pump 107 bbls, Ellis-Madison 1622 ft, td 1630 ft.

NEBRASKA WILDCAT

Nemaha County: Short's Gauchat 1, c nw nw 23-6n-13e, Hunton 1921 ft, so 1947-70 ft, abnd 1970 ft.

NEW MEXICO

Eddy County: Aston & Fair's Stevens 7-B, c sw sw 25-17s-30e, flow 250 bbls, 2-in, shot 65 qts 3288-3311 ft.

Carper Dr. Co.'s Brunning-Grier 1, c sw nw 29-16s-31e, flow 150 bbls, 2-in, natural, 3182-3279 ft.

Penn Surgical et al's Travis 1, ne ne ne 18-18s-29e, flow 60 bbls, 2-in, shot 220 qts 2480-2525 ft.

Sunray Oil Co.-Superior's Foster 4, c ne nw 17-17s-31e, flow 50 bbls, shot 600 qts 3310-3500 ft.

Harvey E. Yates et al's State-Snowden 2, 2085 ft nsl 1875 ft wel 16-19s-30e, elev 3379 ft, pump 150 bbls oil, 350 bbls wtr, 1888-99 ft, td 1900 ft.

Lea County—Maljamar: Johnny Cockburn et al's Miller 19-B, c ne nw 30-17s-33e, flow 50 bbls, 2-in, shot 300 qts 4223-4300 ft, td 4315 ft.

NEW MEXICO WILDCAT

Chaves County—Failure: DeKalb Agricultural Assn's White 1, c nw sw 35-10s-28e, elev 3796 ft, salt 461 to 892 ft, red sand 1400 ft, lime 1940 ft, abnd 7515 ft.

OKLAHOMA

Creek County — SE Stroud: J. J. Fleet's Evens-Grimm 2, se ne ne 8-14n-7e, Prue 2897 ft, shot 400 qts, flow 220 bbls in 22 hrs, 2962 ft.

Creek County—Deep Rock: Tibbins' Wilson 10, nw ne se 18-14n-9e, Prue 2348-82 ft, shot 80 qts, pump 12 bbls, 2384 ft.

Creek County—Glenn: Gulf's Drew 29, se se se 6-17n-12e, Glenn 1421-1584 ft, shot 310 qts, pump 6 bbls oil, 7 bbls wtr in 12 hrs, 1591 ft.

Gulf's Pitman 44, ne se se 7-17n-12e, Glenn 1403-1551 ft, comp for repressure well, 1553 ft.

Garvin County—Pauls Valley: Ohio's A. N. Catlin 1, nw nw se¼ 36-4n-1w, Penn sand 4014-22 ft, Viola 4062 ft, abnd 4100 ft.

LeFlore County—Carterville Gas: Southern United Gas' Echols 1, nw nw ne 21-9n-24e, sand 5273 ft, 13,500,000 gas, 5427 ft.

Lincoln County—N. Agra: Danciger's Scott 2, ne sw ne 31-17n-4e, Cleveland 3171 ft, shot 60 qts, pump 33 bbls, 3208 ft.

Marshall County—Cumberland: Sun's Stout 2, se sw se¼ 18-5s-7e, top sand 6029-60 ft, flow 432 bbls oil, 1-in, 6060 ft.

Okfuskee County—E. Cromwell: Shell's B. Harjo 1, se ne nw 2-10n-8e, Cromwell 3543 ft ns, abnd 3565 ft.

Okmulgee County—Okmulgee: Pine's Hollyman 2A, sw ne se 25-13n-12e, sand 1866-1903 ft, 1,070,000 gas, 1903 ft.

Okmulgee County—Hamilton Switch: Jordan Bros.' Morton 1-B, sw sw se 12-14n-12e, sand 1310-25 ft, 1,000,000 gas, 1325 ft.

Oklahoma County — W. Edmond: Sohio's Harper 2, c sw ne 31-14n-4e, Hunton 6872 ft, flow 385 bbls, ¼-in, pinched to 300 bbls, 7231 ft.

Pontotoc County—Chicasha Gas Field: Mary F. Oil Co.'s Shield-Lee 13, nw se ne 33-5n-8e, Allen 680 ft, sand 780-90 ft, abnd 822 ft.

Seminole County—Jackson: Mid-Continent's Sturgeon 1-A, nw se nw 23-8n-7e, Wapanucka 3264 ft, ns, abnd 3265 ft.

Stephens County—Comanche: Ohio's Wilson Unit 1, nw ne ne 19-2s-7w, Arbuckle 3405 ft, 7-in at 1322 ft, drilled plugs small amount of gas used for lease purposes, abnd 3816 ft, pb 1370 ft.

Stephens County—West Loco: Texas Co.'s R. S. Bristow 3, se sw ne 8-3s-5w, 1000 gals acid, pump 15 bbls, td 1043 ft, pb 1039 ft lime.

OKLAHOMA WILDCATS

Comanche County—Failure: W. E. Henderson's Allison 1, c ne ne se 9-1n-11w, abnd 600 ft.

Greer County—Failure: E. K. McLennan's Briggs 1, nw nw nw 31-6n-21w, ns, abnd 775 ft.

Lincoln County—Failure: Stanolind et al's Rohlinger 1, sw sw ne 29-14n-4e, Wx 5021 ft, CP 5024-29 ft, abnd 5029 ft.

Noble County—Discovery: Gulf's Juanita 1, ne ne ne 1-21n-1e, flow 463 bbls oil, 72 wtr, ¼-in, 4597½ ft.

Payne County—Failure: Carter's Bigler 1, ne se 31-19n-2e, so 4508-16 ft in Misener, Sylvan 4684 ft, Viola 4761 ft, Dense 4805 ft, Dol 4811 ft, Wx 4829 ft, 2 Wx 4860 ft, CP 4830-38 ft, 1760 ft salt wtr, abnd 4909 ft.

Stephens County — Failure: Helmerich & Payne's Mauldin 1, se se sw 2-3s-4w, abnd 4001 ft.

Texas County—Failure: Stanolind's Burton 1, se nw 28-3n-6ec, Alibates 880 ft, Base Blaine 1400 ft, Cimarron 1870 ft, Miss 5215 ft, Simpson 6335 ft, Ellen 6540 ft, Granite 7020 ft, td 7024 pb and abnd 5560 ft.

WEST CENTRAL TEXAS

Coleman County: Hunter & Hunter et al's Taylor 1, nw sw sw H&GN-J. Jasson sur, sec 282, elev 1808 ft, Bend 2877 ft, abnd 3102 ft.

Hightower O & R Co.'s French 1, 500 ft snl 372 ft ewl of 57-ac tr, se part M. A. Fisk sur No. 630, junked and abnd 1009 ft.

Jones County—Wimberly: R. L. Foree and W. H. Sanford's Fikes 2, 680 ft nsl 330 ft ewl nw blk 105, DeWitt CSL, dual well, flow 1800 bbls, ½-in, 1000 gals acid, upper pay 2390-2425 ft; flow 1644 bbls, ½-in, 2000 gals acid, lower pay 2470-2530 ft.

Shackelford County: Baker & Pardue's Davis 7-B, 2250 ft nsl 660 ft ewl T&P 10, blk 13, abnd 1844 ft.

Choate & Sabens' Green 2, 580 ft nsl 200 ft wel T&P 62, blk 12, abnd 1253 ft.

Texzona Prod. Co.'s Huskey 1, 1050 ft fr swl 200 ft fr sel TE&L Co. sec 548, abnd 864 ft.

Stephens County: Woodley Pet. Co.'s E. Thorpe 1, 800 ft out of se cor w½ S. P. Ry. sec 453, elev 1452 ft, Bend 3173 ft, abnd 3365 ft.

WEST CENTRAL TEXAS WILDCAT

Jones County—Failure: Thos. D. Humphrey et al's Bates 1, se se se BBB&C Ry. sec 34, elev 1596 ft, Swastika 3607 ft, Canyon 3694 ft, abnd 4065 ft.

WEST TEXAS

Andrews County—Fullerton: Ohio's University 2, c ne ne sec 5, blk 13, flow 2636 bbls, 1-in, 10,500 gals acid, Wichita-Albany, td 6720 ft.

T. P. Coal & Oil Co.'s McKean-Eilers 1, c sw nw PSL 14, blk A-32, flow 1381 bbls, 2-in, 10,000 gals acid, Wichita-Albany 6760-7206 ft.

Andrews County—Mascho: Superior of Cal.'s Lockhart-Brown 4, 560 ft nsl 1890 ft wel PSL 17, blk A-42, flow 451 bbls, 18/64-in, shot 700 qts 4297-4620 ft.

Cochran County—Slaughter: Magnolia's Mallet 18-C, 580 ft out nw cor lab 21, lge 55, Oldham CSL, flow 907 bbls, 10,500 gals acid 5005-50 ft.

Crane County—McKee: Magnolia's Glenn 3, 3300 ft fr nel 660 ft fr sel H&TC 20, blk 1, elev 2420 ft, McKee sand 6078 ft, pump 235 bbls, perf 6080-90 ft, td 6141 ft.

Crane County—Sand Hills: Magnolia's Lea 27, 1980 ft fr sel 660 ft fr swl PSL 16, blk B-32, flow 438 bbls, 22/64-in, 3000 gals acid 4420-4695 ft.

Ector County — Foster: Schermerhorn Oil Corp.'s Johnson 17-B, se sw nw T&P 11, blk 43, T-2-S, flow 62 bbls, 1-in, natural, 4038-4170 ft.

Ector County—Goldsmith: Bay Pet. Corp.'s Cummins-Sinco 1, 2200 ft out sw cor T&P 26, blk 45, T-1-N, flow 196 bbls, 12/64-in, 12,000 gals acid 4243-4312 ft.

Gulf's Goldsmith 391, 2217 ft nsl 440 ft ewl T&P 7, blk 44, T-1-S, flow 168 bbls with flow valves, 4000 gals acid, td 4250 ft.

Hockley County—Slaughter: Gulf's Gordon 5, 4290 ft snl 660 ft ewl PSL 12, blk X, flow 1218 bbls, 12,000 gals acid, td 5055 ft.

Texas Co.'s Slaughter 147, 1450 ft snl 1321 ft wel lab 72, lge 38, Zavalla CSL, flow 1041 bbls, 12,000 gals acid 4925-5015 ft.

Howard County: Continental-Group 1 Oil Corp.'s Settles 2-S-133, nw nw se W&NW 133, blk 29, pump 46 bbls oil, 87 bbls wtr, sand 1292-1306 ft, td 1318 ft.

Continental's Clay 7, nw nw sw W&NW Ry. 139, blk 29, pump 150 bbls, 2000 gals acid 2465-2533 ft.

Mitchell County — Westbrook: Anderson-Prichard Oil Corp.'s Morrison 6-A, 992 ft nsl 2323 ft ewl T&P 32, blk 28, T-1-N, pump 55 bbls 23-gr, shot 1040 qts 2825-3160 ft.

Col-Tex Ref. Co.'s Abrams-T. P. Land Trust 2, 2317 ft ewl 2309 ft nsl T&P 41, blk 28, T-1-N, pump 82 bbls oil, 7 bbls wtr, shot 920 qts 2810-3225 ft.

Col-Tex Ref. Co.'s Abrams-T. P. Land Trust 5, ne se ne T&P 41, blk 28, T-1-N, pump 77 bbls, shot 740 qts 2882-3172 ft.

Col-Tex Ref. Co.'s Abrams-T. P. Land Trust 7, 990 ft nsl 2320 ft ewl T&P 41, blk 28, T-1-N, pump 97 bbls, shot 1070 qts 3050-3165 ft.

Col-Tex Ref. Co.'s Graebar 3, 2329 ft nsl 1671 ft wel T&P 22, blk 28, T-1-N, pump 72 bbls, shot 960 qts 2980-3110 ft.

Col-Tex Ref. Co.'s Morrison 5, 1655 ft snl 2292 ft ewl T&P 28, blk 28, T-1-N, pump 133 bbls, shot 1190 qts 2919-3075 ft.

Pecos County—Toborg: Stanolind's Toborg 11, 1062 ft nsl 150 ft wel sec 539, Arnold-Barrett sur, pump 30 bbls oil, 18 bbls wtr, shot 35 qts 356-85 ft.

Winkler County — Keystone: Standard of Texas' Baird 26-13, 560 ft nsl 1320 ft ewl PSL 13, blk B-3, flow 209 bbls, 1¼-in, shot 400 qts 3085-3265 ft.

Standard of Texas' Baird 43-13, 2080 ft snl 2520 ft wel PSL 13, blk B-3, flow 245 bbls, ¾-in, shot 440 qts 3114-3295 ft.

Winkler County—Weiner: Ralph Lowe et al's Brown-Altman (Humble) 17, c sw sw PSL 17, blk B-5, flow 120 bbls, 1-in, shot 300 qts 3062-3173 ft, td 3180 ft.

Continental's Brown-Altman 1, se se ne PSL 25, blk B-5, flow 215 bbls, 1-in, shot 300 qts 3045-3140 ft.

Yoakum County—Wasson: Drilling & Exploration's Davis 1-C, 560 ft out sw cor sw ne sec 728, blk D, elev 3697 ft, abnd 5220 ft.

T. P. Coal & Oil Co.'s Bennett 39, c nw nw sec 631, flow 381 bbls, 2-in, 10,000 gals acid 5200-5262 ft.

WEST TEXAS WELLS DEEPENED

Upton County—McCamey: C. E. Marsh et al (was Arnold Oil Co.'s) Harrell 1, 614 ft fr nwl 330 ft fr nel T. C. Ry. sec 11, blk R, otd 2156 ft, pump 30 bbls oil, 45% wtr, 2000 gals acid 1995-2195 ft.

Ward County: Agnew & Sons' Casey 1, 330 ft se & sw of w cor sec 25, but in H&TC 8, blk 34, otd 2312 ft, pump 107 bbls, td 2361 ft.

WEST TEXAS WILDCATS

Pecos County—Failure: Humble's Barnes 1, c s¼ of s¾ H&GN 120, blk 10, elev 2371 ft, Yates sand 990 ft, Whitehorse 2030 ft, San Andres 2030 ft, San Angelo 2655 ft, Ellen 4340 ft, abnd 4525 ft.

Terrell County—Failure: Henry Schooler & Curtis Norman's Allison-Merck 1, 660 ft nsl 1920 ft wel CCSD&RGNG sec 5, blk B-2, elev 2609 ft, lime 1215 ft, abnd 2367 ft.

SOUTHWEST TEXAS

Jim Hogg County—East: Sun's East 7-D, 3400 ft fr most w'ly wl 2890 ft fr most n'ly sl 4480-ac lse, Santo Domingo de Arriba Gr, temp abnd 424 ft.

Jim Hogg County—Weil: Sun's Weil Bros. 8, 2592 ft fr nl 1640 ft fr el blk 4, Palitos Blancos Gr, 25,733-ac tr, 5⅛-in 5091 ft, perf 5045-49 ft, flow 258 bbls, 5/32-in, td 5091 ft.

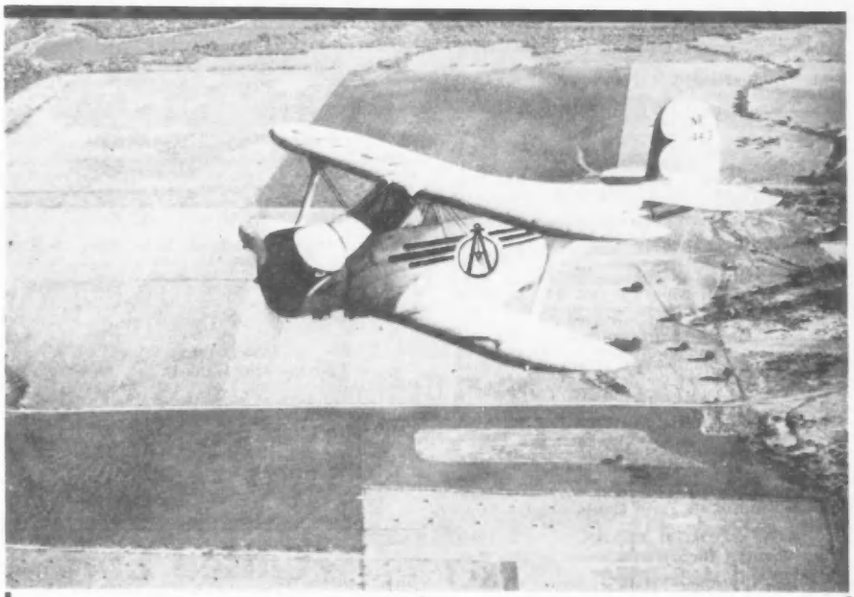
Starr County—Garcia: Sun's Frost National Bank 3-B, 467 ft fr el 4985-ac tr, Y. Trevino porc 96, n flank, 5½-in 3759 ft, perf 3753-56 ft, flow 118 bbls, 1/8-in, td 3759 ft.

Starr County—Guerra: Sun's Guerra & Sons 15-A, 2028 ft fr swl 3550 ft fr sel, Las Cuevitas Gr on 1360-ac lse, 5¾-in 2253 ft, perf 2235-42 ft, flow 102 bbls, 3/16-in, td 2254 ft.

SOUTHWEST TEXAS WILDCATS

Duval County—Failure: American Republics' Kreis 1, 2052 ft fr nl, 2315 ft fr wl AB&M sur 228, 3 mi e Kreis field, abnd 4007 ft.

Jim Hogg County—Failure: Massingill &



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Spice's (Rosa) Palacios 1, 1110-ac lse, G. W. Waddell sur 232, 4½-in ml sw Randado, abnd 3210 ft.

McMullen County—Failure: Edwin M. Jones-Ezzell, Agt. 103, sec 39, Ezzell Rch subdvn, 10 ml sw Simmons City, abnd 1984 ft.

SOUTHWEST TEXAS EXTENSION

Jim Hogg County—Armstrong: Texas Co.'s Armstrong 1-B, 375 ft fr n&el, E. L. Armstrong sur 297, 1640-ac lse, 5½-in 3662 ft, flow 153 bbls, ¼-in, td 3668 ft. Extends prodn 3925 ft sw.

SOUTHWEST TEXAS NEW PAY

Starr County—North Rincon: Sun's DD Oil Co. 2-B, 467 ft fr nl, 1467 ft fr el 294-ac lse, BS&F sur 77, 5½-in 4630 ft, perf 4370-75 ft, 146 bbls, ⅛-in, td 5853 ft.

LOWER TEXAS COAST

Jackson County—West Gamado: The Bering Co.'s Cherry 1, 330 ft fr el&ssel T&NO RR ROW 94-ac tr, W. F. Menefee sur, w flank, abnd 4803 ft.

Jim Wells County—Canales: Sun's Canales 2, 2200 ft fr el, 660 ft fr nl, 3427 ft fr wl CCSD&RGNG sur 345, 3288-ac tr, temp abnd 2140 ft.

Jim Wells County—Seeligson: W. A. Richardson's Breen-Horsting 2, 990 ft fr sl, 330 ft fr nl, 408 ft fr wl lot 20, sec 49, Haldeman subdvn Seeligson Rch, Richard Ross sur 334, 5½-in 6145 ft, dual comp, perf 4908-18 ft, 114 bbls, ⅛-in; perf 5974-94 ft, 140 bbls, ⅛-in, td 6146 ft.

Shell's Seeligson 19, 689 ft fr w'ly wl, 632 ft fr nl 990-ac tr, Willis Millican sur 335, 5½-in 6032 ft, dual comp, perf 5928-48 ft, 153 bbls, 7/64-in; perf 4900-10 ft, flow 259 bbls, ¼-in, td 6034 ft.

Karnes County—Hobson: Seaboard's Pluezkhan 3, 500 ft fr s&wl 114-ac lse, Don Erasmo Seguin gr, 5½-in 4051 ft, perf 4042-46 ft, 178 bbls, 5/32-in, td 4051 ft.

Kleberg County—Seeligson: Humble's King Ranch-Cabeza 24, 660 ft fr wl, 1158 ft fr sl GH&H sur 47, 6420-ac lse, 5½-in 5273 ft, perf 5215-40 ft, 93 bbls, ⅛-in, td 5273 ft.

Nueces County—Stratton: Sam E. Wilson's Union Central Life Insurance 5, 467 ft fr nl, 2563 ft fr el frac sec 2, Charles Stratton subdvn, Paso Ancho de Arriba gr, 396-ac lse, 5½-in 6330 ft, perf 6265-75 ft, flow gas & cond, abnd 6850 ft.

Texon Royalty Co.'s Elliff 10, 467 ft fr wl, 2353 ft fr sl 3054-ac tr, Antonio Longoria gr, temp abnd 5831 ft.

San Patricio County—Midway: Texas Conservative Oil Co.'s Crites 5, 1547 ft fr nwl, 1146 ft fr swl 172-ac lse, blks F&H Coleman-Fulton Pasture subdvn, e flank, abnd 5341 ft.

NORTH TEXAS

Clay County—Ross: Continental et al's Ross 12, 1333 ft nsl 440 ft wel tract, Wm. Walker sur, flow 105 bbls, ½-in, natural, Strawn 4046-68 ft.

Cooke County: Kewanee Oil Co.'s Hyman S-A, 410 ft wel 865 ft snl 208-ac tr, T. J. Moss sur, pump 15 bbls, shot 10 qts 1230-34, 30 qts 1241-52 ft, td 1301 ft.

Jack County—Hoefle: Standard of Texas-Hanlon & Buchanan's Cantrell 1, 495 ft out ne cor S. P. Ry. 2, A-1629, Bend 4706 ft, flow 567 bbls, 5/16-in, 5000 gals acid 4711-24 ft.

Montague County—Bowers: Texas Co.'s Cobb 1, 330 ft out se cor, C. A. Barnes sur A-48, pump 42 bbls, sand 2440-46 ft, shot 5 qts 2448-51 ft, td in granite 3394 ft, pb 2446 ft.

Montague County—Hildreth: Continental's Coffield 1, 965 ft nsl 330 ft wel sw sec 52, A. L. Ravia sur A-1488, Bend 6026 ft, flow 530 bbls, ½-in, natural, perf 6085-6114 ft, td 6387 ft, pb 6210 ft.

Continental's Hamilton 1, 2474 ft snl 2181 ft ewl sec 57, E. T. Ry.-G. E. Nabours sur, Bend 6115 ft, flow 96 bbls, ½-in, 500 gals acid, perf 6212-24 ft, td 6562 ft, pb 6247 ft.

Montague County—Rogers & Rogers: Rogers Bros. et al's Astley-Texaco 8, 330 ft snl 466 ft ewl, J. Lenow sur, Bend 5183 ft, flow 920 bbls natural, perf 5230-54 ft, td 5304 ft.

Montague County—Stoneburg: Continental's Heard 3, 1535 ft nsl 990 ft ewl Limestone CSL sec 4, Bend 6065 ft, pump 25 bbls, 4000 gals acid, perf 6080-6110 ft, td 6610 ft pb 6155 ft.

Throckmorton County: Grisham - Hunter Corp.'s Kelley 1-B, 200 ft out se cor sec 32, C. I. R. sur, abnd 958 ft.

Grisham-Hunter Corp.'s Kelley 2-B, 200 ft out se cor, H. R. Threadwell sur A-876, abnd 751 ft.

Wichita County: H. S. & C. B. Grace's Dunn 4, 150 ft nsl 3950 ft ewl blk 2, H. Anderson sur A-1, pump 8 bbls 576-80 ft.

Texas Co.'s Waggoner Est. 444-A, 600 ft snl 250 ft wel T. C. Ry. sec 2, A-632, pump 4 bbls, shot 5 qts 543-45 ft.

Wichita County—West: Continental et al's Barber 1, 330 ft out ne cor of 49-ac lse, J. R. Cook sur A-40, flow 84 bbls, ½-in, natural, Strawn 4233-66 ft, td 4268 ft.

NORTH TEXAS OLD WELL DEEPENED

Jack County—Hoefle, Standard of Texas-Hanlon & Buchanan's Starr-Leach 1, 495 ft snl 605 ft ewl S. P. Ry. sec 1, otd 5051 ft, abnd 5263 ft.

NORTH TEXAS WILDCATS

Archer County—Failures: Akin-Dimock et al's Perryman 1, 1412 ft snl 300 ft wel sec 16, J. W. Harris Club Ranch sur, abnd 1531 ft.

M. W. Blair Oil Co.'s Scott 1, 600 ft out se cor lot 15, Thos. McCoy sur A-269, abnd 1200 ft.

Young County—Padgitt New Pay: Shell's Scott 1-B, 372 ft nsl 350 ft ewl se¼ TE&L Co. sec 334, 1 mi e Miss prod, Bend 4132 ft, Miss 4742 ft, Barnett 4705 ft, Ellen 4918 ft, pump 131 bbls, 2000 gals acid Bend perf 4190-4208 ft, td 5472 ft, pb 4648 ft.

EAST TEXAS

Wood County—Quitman: Rogers Lacy et al's Chrietzberg-Humble 1, 4400 ft ewl 3550 ft nsl, Hazard Anderson sur, Georgetown 5010 ft, Paluxy series 6264 ft, sand 6290-6316 ft, flow 506 bbls, ¼-in, td 6356 ft.

Shell's Nell Kirkland 1, 2200 ft snl 750 ft wel, E. Goodsir sur, elev 447 ft, Georgetown 6138 ft, flow 524 bbls, ¼-in, sand 6332-46 ft.

TEXAS PANHANDLE

Collingsworth County: Jenkins & Portman's Bell 1, sw ne ne H&GN 13, blk 14, elev 2258 ft, 2,600,000 gas, 250 lbs, lime 1995-2152 ft, shot 110 qts 2142-96 ft, td 2235 ft, pb 2204 ft.

Gray County: Texas Co.'s Key 4, 330 ft snl 3157 ft ewl sec 1, B. & B. sur, pump 244 bbls, shot 472 qts 2706-2811 ft, td 2841 ft.

TEXAS GULF COAST

Hardin County—Saratoga: Rio Bravo's Fee J-547, 143-ac lse, CSF Jordiz sur, abnd 1575 ft.

Harris County—Humble: Texas Co.'s Stevenson Fee 54, 2403 ft fr sl 930 ft fr el 517-ac lse, temp abnd 8685 ft.

Jefferson County — Stowell: Texas Co.'s Brauer 1, 330 ft fr n&el se¼ blk 31, E Lopez sur, 5½-in 7684 ft, perf 7650-66 ft, flow 388 bbls, 12/64-in, td 8245 ft.

TEXAS GULF COAST NEW PAY

Montgomery County—Lake Creek: Superior's McWhorter 6-A, 6315 ft fr sl 2515 ft fr el, T. J. Nichols sur, triple comp, 7⅝-in 10,221 ft, "A" sand perf 9206-30 ft, 113 bbls oil, 1,254,000 gas, ¼-in; "B" sand perf 9730-58 ft, 192 bbls oil, 2,050,000 gas, ¼-in; "unclassified sand" perf 8798-8808 ft, new pay for area, tested & shut in, no gauge, td 11,240 ft.

TEXAS GULF COAST WILDCATS

Jefferson County—Failure: Glenn H. McCarthy's McFaddin Trust 1, 320-ac tr, T&NO sur sec 143, 6 mi ne Stowell, abnd 10,580 ft.

Fort Bend County—Failure: H. M. Naylor Oil Co.'s Randle 2, 547-ac lse, Jane H. Long sur, abnd 9183 ft.

Wharton County — Discovery: Seaboard's Duson 1, 160-ac lse ETRR sur, 4½ mi nw Danevang, 5½-in 6160 ft, perf 6150-54 ft, 185 bbls, ⅛-in, td 6160 ft. Opens South El Campo field.

WYOMING

Big Horn County—Byron: Ohio Oil's David Williams 1, se sw Lot 39, 56n-97w, 6⅝-in 5521 ft, pump 150 bbls oil, 36% water, Tensleep 5512 ft, td 5634 ft, pb 5576 ft.

Niobrara County—Lance Creek: Continental's Otto Rohlff 15, se sw sw 32-36n-65w, 7-in 4401 ft, swab 216 bbls Converse sand, td 4463 ft.

Park County—Elk Basin: Continental's Elk-2 103, sw sw ne 24-58n-100w, 7-in 4424 ft, flow 2256 bbls, Tensleep 4285-4483 ft.

WYOMING WILDCAT

Niobrara County — Lance Creek: Superior Oil Co.'s Ong 1, c se sw 31-36n-65w, abnd 10,910 ft.

United States Wildcat Starts

ARKANSAS

Yell County: Lion Oil Refining Co.'s McClure 1, c sw se 19-7-21, permit obtained.

CALIFORNIA

Butte County: Richfield's Dayton Comm. 1, sw se se 6-21-1, Chico area, gas test, mim.

Fresno County: Standard's 1, 3-17-14, Cantua Creek area, lcn.

Glenn County: General Petroleum Corp.-Union's Dolan 1, c sw ne 33-23-3, Orland area, mim.

Kern County: Standard's Ethel D, S. 1, se nw se 36-12-24, Midway area deep test, rig.

Los Angeles County: Chanslor Canfield Midway Oil Co.'s Whittier Comm. 4-1, 660 ft s 131 ft e Whittier Blvd at r/a to c/l Scott Ave, rig.

Seaboard's 1, 1600 ft s 600 ft w c/l Bard and Landa Sts, Elysian Park area of Los Angeles, lcn.

Selbar Oil Co.'s 1, 1427 ft s 1320 ft e c/l 223rd St and Avalon Blvd, Dominguez area, lcn.

ILLINOIS

Clinton County: Stanolind's C. D. Phillips 1, nw nw nw 4-2n-3w, lcn.

Marion County: C. E. Williamson's Barton 1, se se sw 30-2n-1e, lcn.

INDIANA

Vanderburg County: Ryan Oil Co.'s Barrett 1, c se ne 1-7s-10w, lcn.

KANSAS

Barber County: Champlin's Gentry 1, estate, nec sw, 13-33s-15w, lcn.

Butler County: Zephyr Drlg. Co. et al's Phillips 1, ne ne nw 20-29s-5e, woc.

Cowley County: E. F. Wakefield's Lipperd 1, nw sw sw 32-31s-3e, c&p.

E. F. Wakefield-Continental's C. E. Martin 1, nw se nw 12-32s-3e, woc.

A. M. Horrall et al's Anderson 1, swc 17-32s-7e, lcn.

Sohio's Winters 1, c s½ se se 2-33s-3e, mim.

Finney County: Shallow Water Frg. & Harbar's First Nat'l Bank of Hays City 1, c ne se 30-21s-33w, lcn.

Greenwood County: Slocum's et al's Larson 1, swc ne 34-25s-9e, rum.

McPherson County: Phil-Han-Phillips' Duvall 1, sw ne ne 21-18s-1w, dr 850 ft.

Russell County: Goff Davis' Klaussen 1, sw cor 27-12s-14w, lcn.

KENTUCKY

Hopkins County: Pure's O. C. Whitefield 1, 1-K-25, lcn.

Logan County: Shell's C. N. Stagner 1, 14-F-33, lcn.

Muhlenberg County: R. A. Cullinan & Son's E. Land 1, 15-1-29, dr.

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MICHIGAN

Clinton County: C. W. Teater's Walker 1, w½ sw nw 8-7n-1w, dr.

Isabella County: Rex Oil & Gas Co.'s Nurnberger 1, nw ne ne 25-16n-3w, dr.

Kent County: S. L. McCall's Alles 1, sw nw sw 12-8n-11w, lcn.

Lake County: Freeman Oil Co.'s Castlebar 3, nw sw sw 20-17n-11w, rig.

C. L. Maguire's Choponis 1, nw nw nw 30-20n-11w, dr.

Missaukee County: Gordon Oil Co.'s DeKracker 1, w½ sw sw 34-21n-6w, rig.

Newaygo County: Jetter and deKrafts' Bridges 1, n½ ne nw 29-15n-11w, lcn.

Osceola County: Rex Oil & Gas Co.'s Keller 1, sw sw nw 30-17n-10w, lcn.

Van Buren County: C. W. Clock's Decker 1, se nw ne 31-1s-15w, lcn.

OKLAHOMA

Coal County: Phillips-Skelly's Payte 1, nw se ne 28-2n-9e, lcn.

Garvin County: Stanolind's Betty 1, ne nw ne 22-3n-1w, lcn.

Hughes County: Burk-Greis' Wilbanks 1, nw ne nw 2-5n-9e, dk.

Deep Rock's Myers 1, se se ne 7-7n-10e, lcn.

Marshall County: Texas Co.'s Quinton Little 1, se nw sw 19-8s-6e, bldg. dk.

Okfuskee County: Texas Co.'s Tanner 1, sw se ne 28-12n-9e, lcn.

WEST TEXAS

Culberson County: Standard of Texas' Grisham-Hunter 1, lse 2, 1980 ft wel 1931 ft snl PSL 16, blk 54.

Fisher County: Condor Pet. Co.'s J. J. Steele 1, 150 ft nsl 330 ewl of sw-40 ac of BBB&C Ry. sec 210, to dd fr 3210 ft to 6500 ft, or Ellenburger.

Kent County: Blackwell O & G Co.'s A. A. House 1, 1408 ft ewl 1335 ft snl PSL sec 8, blk B, lcn 7400-ft test.

WEST CENTRAL TEXAS

Brown County: R. L. Orand et al's E. D. Sheffield 1, 894 ft wel 160 ft nsl, R. Overton sur No. 7, lcn 1000-ft test.

Jones County: John P. Byram, tr.'s J. M. Alexander 1, 2000 ft fr m/s/n 3000 ft fr m/w/w lines T&P Ry. 3, blk 14, lcn 2100-ft test.

Thos. D. Humphrey et al's J. S. Bates 2, 990 ft snl 2970 ft wel s½ BBB&C Ry. sec 34, mim for Canyon test.

SOUTHWEST TEXAS

Duval County: Atlantic's Martex - Welder 2-A, Martex area, 1151-ac lse, M. G. Nunez sur 4, 13 mi nw San Diego, lcn 4500-ft test.

Jim Hogg County: Texas Co.'s Yaeger 1, 1165-ac lse, BS&F sur, 2 mi nw Yaeger field, lcn 4500-ft test.

Starr County: T. E. Stephens' Hinojosa 2, 7500 ft fr nwl 6000 ft fr swl 4767-ac lse, porc 109-110-111, 22 mi nw Rio Grande City, lcn 2500-ft test.

J. B. Stoddard's Pilar Guerra de Saenz 1, n 160-ac of share 21-B, Miguel Perez porc 106, 4 mi ne El Sauz, lcn 4000-ft test.

Sun's Ramierz 1-B, 495 ft fr el 1485 ft fr nl 3767 ft fr sl TTRR sur 173, 7 mi wnw Sun field, lcn 5500-ft test.

Sun's Solis 1, 60-ac lse, share 2-A, P. Longoria porc 94, Juris of Camargo, 2 mi sw Frost field, lcn 6500-ft core test.

Guadalupe County: W. H. Schafer's Weber 1, 207-ac tr, Guadalupe Torres sur, 5 mi sw Marion, lcn.

TEXAS GULF COAST

Chambers County: Sun's Daugherty 1, 40-ac unit, lots 15 & 16, F. Valmore Lge, 3 mi n Winnie townsite, lcn 9500-ft test.

LOWER TEXAS COAST

Bee County: W. Earl Rowe's Peters 1, 200-ac tr, Edwin Morehouse sur, 5 mi ssw Beeville, lcn 4500-ft Vicksburg test.

Jim Wells County: W. A. Richardson's von Blucher 1, n 80-ac of 350-ac tr, Mrs. L. Best sur, 2 mi sw Canales field, lcn 7300-ft test.

Live Oak County: Continental Oil Co.'s Somerset Land & Cattle 2, 2970 ft fr nwl 1075 ft fr swl, P. Chapa sur 300, lcn 10,000-ft test.

Henderson Coquat's Nelson 1, 400-ac lse, Guadalupe Braba sur 28, 9 mi ene Whitsett, lcn 7000-ft test.

Humble's Pace 1, 292-ac tr, John H. McMullen sur 15, 1 mi wsw Mikeska, lcn 4000-ft test.

Willacy County: Sun's Santa Rosa 1, 1485 ft fr nl 1485 ft fr el 10,088-ac lse, share 44, San Juan de Carricitos Gr, 8 mi se Raymondville, lcn 11,500-ft test.

EAST TEXAS

Nacogdoches County: F. K. Lytle et al's J. R. Summers 1, 660 ft fr m/n/nl 660 ft fr m/n/el of 230.2-ac tr, John Reid sur, 5 mi e by n Nacogdoches, lcn 9000-ft test.

NORTH TEXAS

Archer County: M. W. Blair Oil Co.'s Henry Conrady 1, 600 ft snl 200 ft wel sec 22, blk 4, Clark-Plumb sur, lcn.

W. W. Harvey et al's T. B. Wilson 1, 1740 ft nsl 1680 ft wel sec 151, Harris Club Ranch sur, lcn 1600-ft test.

Frank Wood et al's Abercrombie-Taylor 1, 150 ft nsl 550 ft wel sec 82, Harris Club Ranch sur, lcn 1450-ft test.

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Needed Both

"John, there's a burglar at the silver and another in the pantry eating my pies. Get up and call for help."

"Police! Doctor!"

Executive Ability

"A 40-foot flagpole has fallen down. You have a sergeant and a squad of 10 men. How do you erect a flagpole again?"

The class of potential lieutenants offered suggestions involving a block-and-tackle, derrick, and so on.

"You're all wrong," explained the colonel. "You'd say, 'Sergeant, get that flagpole up'."

Family Matter

A bored cat and an interested cat were watching a game of tennis.

"You seem very interested in tennis," said the bored cat.

"It's not that," said the interested cat, "but my old man's in the racket."

Talking Bugs

"I see in the papers a scientist claims that insects can talk to each other."

"Of course they can. Aren't moths always chewing the rag?"

Baffled Professor

Mrs. Professor: "Darling, do you know you haven't kissed me for three weeks?"

Absent-minded Professor: "Good heavens! Then who have I been kissing?"

Well Preserved

"You certainly are well-preserved for your years."

"Well, why not? I get canned at every place I work."

Logic

"Which travels faster, heat or cold?"

"Heat."

"What makes you think so?"

"Well, you can catch cold."

Under the Table

"Bill and Sue were the best looking couple on the floor last night."

"Oh, did you go to a dance last night?"

"No, I went to a cocktail party."

Cautious to the End

"But surely you agree to take out a policy to cover your burial expenses."

"Na, na, mon. I might be lost at sea."

The Reply Tart

What books have helped you most? Mother's cook book and father's check book.

Weather Forecast

I'll just fine you for speeding today, but next time it'll be jail!

I get it. Fine today—cooler tomorrow!

Just Foolin'

Hey you, stand at attention!

I am at attention, sir. It's this uniform that's at ease.

Poor Choice

"If I grow up will I have a husband like papa?"

"Yes, dear."

"And if I do not get married will I be an old maid like Aunt Susan?"

"Yes."

"Well, I am in a fix."

Confusion at Camp

"How long have you been in the Army?"

"Two days, sir."

"Have you been instructed to salute an officer when you meet one?"

"Yes, sir."

"Why did you fail to salute me a little while ago?"

"But, sir, I was distinctly told not to salute an officer with a cigarette in my mouth."

Good Precedent

"Do you think I'm going to wear this old squirrel coat all my life?"

"Why not, dear? The squirrels do."

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STANDCO BRAKE LINING
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HOUSTON

STATEMENT OF CONDITION OF THE

FROST NATIONAL BANK of SAN ANTONIO

To the Comptroller of Currency at Close of Business, Dec. 31, 1943

RESOURCES

Cash		$21,752,776.55
U. S. Government Obligations (All carried at par or less)		56,608,398.18
Investment Bonds and Municipal Obligations (All carried at par or less)		2,668,860.00
Stock in Federal Reserve Bank		90,000.00
Loans and Discounts		5,677,640.74
Interest Earned but not Collected		139,115.52
Building Account		913,549.74
Other Real Estate Owned		1.00
TOTAL		$87,850,341.73

LIABILITIES

Capital Stock		$ 1,200,000.00
Surplus		1,800,000.00
Undivided Profits—Net		248,979.06
Reserve for Taxes, Interest, etc.		217,713.52
Interest and Discount Collected but not Earned		14,511.26
Reserved for Undeclared Dividends		96,000.00
Deposits: Commercial	$50,705,442.63	
Corresponding Banks	11,538,785.44	
Time	9,895,534.74	
Public Funds	3,852,400.29	
United States Government Deposits	6,280,430.14	
Other Deposits, Certified and Cashier's Checks	2,000,544.65	84,273,137.89
TOTAL		$87,850,341.73

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President Brown Paper Co., Monroe, La.

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President San Antonio Buick Co.

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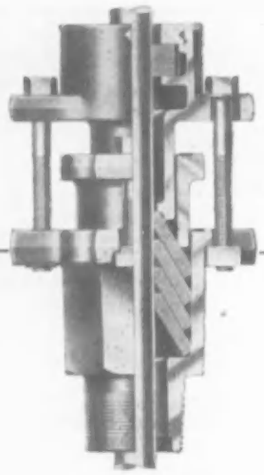

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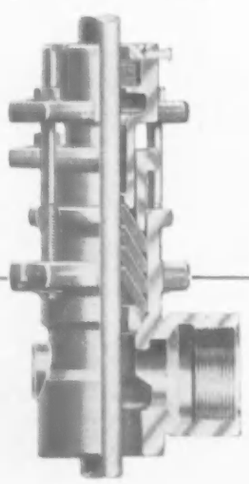

Men in the Industry's News

C. H. LIEB, in charge of the foreign producing subsidiaries of Standard Oil Company (New Jersey), is inspecting operations in the Mid-Continent and Mississippian areas.

F. E. HUDSON, for some years with Anderson-Pritchard Oil Corporation, has accepted the position of field superintendent for Northern Ordnance, Inc.

ALEX W. McCOY, vice president of Deep Rock Oil Corporation, Tulsa, addressed Tulsa Geological Society January 25 on "Stratigraphic Geology in Italy."

PAUL H. GIDDENS of Meadville, Pennsylvania, has recently been appointed curator for the Drake Well Memorial Park, at Titusville, Pennsylvania. Professor Giddens is head of the department of history and political science at Allegheny College, and will serve as curator only on a part-time basis. His book, "The Birth of the Oil Industry," was published in 1938, and in 1941 he issued a second volume, "The Beginnings of the Petroleum Industry: Sources and Bibliography."

ROBERT I. DICKEY, West Texas district geologist for Forest Development Corporation, Midland, has been elected president of the West Texas Geological Society, succeeding Fred H. Wilcox. George R. Gibson, Richfield Oil Corporation, and Miss Jane Ferrell, Magnolia Petroleum Company, were chosen vice president and secretary-treasurer, respectively.

R. N. McGEE, special sales representative of Jones and Laughlin Steel Corporation, lectured to students in petroleum engineering at the University of Texas recently on the manufacture of steel and wire rope. His talk was illustrated by means of moving pictures of steel operations.

GERRIT C. HASPER, having received an honorable discharge from the Army, has joined the oil field sales division of Continental Motors Corporation, with offices at the Muskegon, plant, Muskegon, Michigan.

F. JULIUS FOHS announces removal of his New York office which has been located at 183 Madison Avenue, to Room 1106, 11 East 44th Street, New York 17.

LOUIS FINCH, JR., Stanolind Oil & Gas Company, Odessa, Texas, has been elected president of the Permian Basin Engineering Association. Other officers include: E. H. Griswold, Goldsmith Pool Engineering Committee, vice president; H. E. Berg, Tide Water Associated Oil Company, secretary-treasurer, and S. J. Leach, Humble Oil & Refining Company, program chairman.

LEON E. OSMER and Melvin H. McKinney, engineers, have recently joined the gas processes division of the Girdler Corporation, Louisville, Kentucky. Osmer, a native of Iowa, has been with the Semet Solvay Engineering Corporation since 1924. McKinney, a native of Texas, has been with Lago Oil and Transport Company, spending much of the time since 1930 in Aruba. Since American entry into the war he has been with Dow Chemical Company and Sinclair Rubber Company.

WORTH B. ANDREWS, SR., and JR., oil operators of Fort Worth, have opened offices at 1112 Alamo National Bank Building, San Antonio. Lt. Worth B. Andrews, Jr., has just been commissioned from the Cavalry School, Fort Riley, Kansas.

GLENN HOHIMER, safety engineer of Oklahoma City, spoke on "The Timely Need of Increased Safety Instruction," before the monthly meeting of the Seminole Chapter of American Petroleum Institute, at Seminole, Oklahoma, January 19. At the same meeting, Jack Hynal, of the United States Bureau of Mines, McAlester, Oklahoma, spoke on "The Timely Need of First Aid Instruction."

BOB GILMOUR, vice president of Cardwell Manufacturing Company, Wichita, Kansas, will leave about February 1 for South America. His itinerary will include every oil-producing country in South America and every major oil field.

JAMES H. JEWELL has been appointed assistant manager of Industry Departments for Westinghouse Electric and Manufacturing Company, with headquarters in Pittsburgh. He will supervise all activities of the department except data and training and general contract.

Jewell attended Pratt Institute and Temple University before enrolling in

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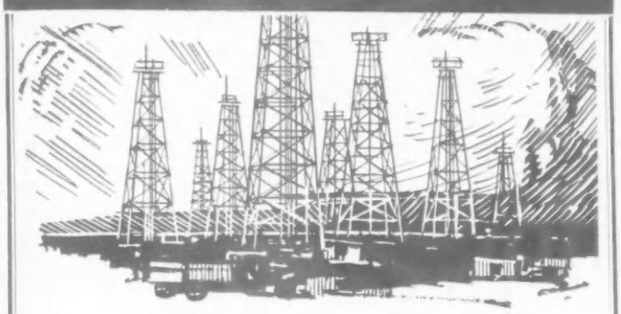

Beginning at Petrolia back in 1908 with only a span of mules, our operations during the past thirty-six years have extended into California, Colorado, Oklahoma, Arkansas, Mississippi, Louisiana, and all of Texas. From Electra, Smackover, Mexia and Burkburnett to the present, our records show more than 2,000 oil and gas wells drilled under every condition. We have helped push derricks higher — and pipe lower, past 12,000-foot levels in the search for crude. We have used everything from the makeshift equipment of other days to our present modern rigs with gasoline, heavy steam, electric and diesel power. The experience we have gained is invaluable and the 250 men in our organization have a knowledge of drilling second to none in the business. We have come a long way in these thirty-six years and we're proud of our part in helping develop the industry. We look forward to new development with the same anticipation that we had in 1908.

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the Westinghouse graduate student course in 1920. His first assignment, after completing the course in 1922, was in the small motor section at the East Pittsburgh Works. He soon went to the Philadelphia office as sales assistant, later became a salesman in the building section and in 1930 was made manager of the construction industry section.

After returning to East Pittsburgh in 1938 as manager of the public works and communications sections, Jewell was shortly transferred to Philadelphia as manager of agency sales of the Middle Atlantic district. In 1939 he came back to East Pittsburgh as assistant manager of the agency sales department.

HARRY L. BALDWIN, Phillips Petroleum Company geologist at Bartlesville, addressed Tulsa Geological Society January 17 on "The Oil Industry in Argentina."

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